COLOR IMAGE SCANNER
CS1000

SERVICE MANUAL

GRAPHTEC CORPORATION

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		10.6 Color Difference Test Chart - Revised	10-22	
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1. OVERVIEW

1.1 Features

CS1000 Features

- **600-dpi optical resolution for high-precision image scanning**
  Scanning with an optical resolution of 600 dpi allows even complex and difficult-to-scan documents, such as CAD drawings, electronic files, and mapping data to be scanned rapidly and with high precision. Scanning Master 21+ (scanner software included as a standard accessory) can be used to adjust the resolution in five levels (200 dpi to 800 dpi) to suit the scanned document.

- **Compatible document widths range from 210 mm to 1000 mm**
  Compatible with document sizes from ISO A4 up to ANSI E

- **Capable of color and grayscale scanning**
  Capable of scanning in color (8-bit color) or grayscale (256 shades)

- **Capable of reading long-axis data**
  Long-axis images are supported with a maximum length of approximately four meters each.

- **Compact and lightweight design**
  A compact design was achieved by using a document travel system that employs closely-adhered image sensors in the sensor unit (five rows arranged in a zigzag pattern).

- **Image-processing functions**
  Use of the scanning software provided lets you set image-processing functions for the scanning of a document.

- **Interface**
  The CS1000 interface conforms to the SCSI-2 standard.

CS1000EV Series Features

- Extremely fine scanning is made possible by the highest resolution in its class of True 600 dpi ±0.1% ±5 pixels 0.1% ±3 pixels for CS1100EV).
- Resolution can be selected in the range 200 dpi to 800 dpi(*1) according to the image density and intended purpose.
- High-speed scanning of approximately 1.28 inch/s(*2) for color and approximately 3.8 inch/s(*2) for monochrome allows for efficient digitizing of even large volumes of documents.
- Incorporates a C.D. Reduction (Color Depth Reduction) function to convert 24-bit color data to practical 8-bit color data for smooth color scanning.
- ScanningMaster 21+ is included and is compatible with ScanningMaster 21, the benchmark for high performance and high operability.

*1 Interpolated resolution

*2 At 200 dpi, not including data transfer time.

1.2 Additional Functions of CS1000EV Series

- Includes the new Express Mode for high-speed data transfer for color scanning.
- Includes correction functions to smooth the intensity differences for the join sections of image sensors, which are arranged in a zigzag pattern, in the primary scanning direction.
- A high-pressure medium hold-down unit (document hold-down unit EV) is included as standard for thick media (e.g., with folds, or creasing).

1.3 Cautions for CS1000EV Series

- The CS1100EV should always be used with the document support wires on the main unit, regardless of the type of document being scanned. There is a risk of damage to the document if it comes into contact with the SCSI cable.
- Do not scan thin or limp documents such as plain paper less than 0.08 mm thick using the document hold-down unit EV. This may damage the document or cause paper jamming.
- The number of attachment holes for the document hold-down CS on the hold-down unit EV differs from the standard unit. When replacing, use "Hold-down CS-JEC" (new).
- The power supply unit installation positions differ from the CS1000.
  CS1000: In sequence 3.3 V, 5 V, 24 V from top
  CS1000EV (B0 size or larger): In sequence 5 V, 3.3 V, 24 V from top
  CS1100EV (A0 size or larger): In sequence 5 V, 3.3 V, 24 V from top
  TM9000 (A0 size or larger): In sequence 3.3 V, 5 V, 24 V from top
  TM9000 (B0 size or larger): In sequence 5 V, 3.3 V, 24 V from top

1.4 Product Differences

	CS1000	CS1000EV	CS1100EV
Electrical		• Same as CS1000	• Main board (new) • Image sensor unit maintenance (new) • Cable items (new)
Mechanical		• Power supply unit installation positions changed. • Document hold-down unit EV (new) • Hold-down CS-JEC (new)	• Power supply unit installation positions changed. • Pinch roller unit maintenance (new) • Glass base unit maintenance (new) • C1 hold-down CS (new) • Desktop mounted (Optional stand)
Firmware	Ver 0.9X to Ver 1.XX Note: Do not install CS1000EV firmware.	Ver 2.0 onward • Supports Express Mode.	Ver 1.0 onward • Supports Express Mode.
Functions		• Includes Express Mode high-speed transfer (24-bit to 12-bit processing) • Join correction between sensors	
Accessories		• Hooks	• Hooks are contained in stand.
		• Document hold-down unit EV (new)	

1.5 Standard Specifications

Item	CS1000	CS1000EV	CS1100EV
Document size	ANSI E to ISO A4 (all sizes centered)		
Effective scanning area	Width: 914 mm (max. 1,000 mm width) sensored Length: 1,188 mm (banner format up to approx. 4 m possible)*1		Width: 594 mm (max. 630 mm width) sensored Length: 1,188 mm (banner format up to approx. 4 m possible)*1
Document thickness	1.5 mm or less (including the carrier sheet)*2		
Optical resolution	600 dpi		
Interpolated resolution	Main scanning direction : 200 dpi, 300 dpi, 400 dpi, 600 dpi Secondary scanning direction : 200 dpi, 300 dpi, 400 dpi, 600 dpi, 800 dpi		
Main scanning system	Close-contact image sensor system 5 A4 sensors in zigzag pattern		Close-contact image sensor system 3 A4 sensors in zigzag pattern
Sub scanning system	Document travel (sheet through) system		
Scanning speed*3	Monochrome: Approx. 1.3 ms/line (at 600 dpi) 3.8 inch/s (at 200 dpi) 1.9 inch/s (at 400 dpi) 1.26 inch/s (at 600 dpi) Color: Approx. 3.9 ms/line (at 600 dpi) 1.28 inch/s (at 200 dpi) 0.64 inch/s (at 400 dpi) 0.42 inch/s (at 600 dpi)		
Scanning precision*4	±0.1%, ±5 pixels		±0.1%, ±3 pixels
Gradation	Monochrome: Bilevel, intermediate tones (dithering, error diffusion) Gray : 256 shades Color : 256 colors		
Light source	LED (RGB)		
Interface	SCSI-2		
Output	Image data		
Rated power supply	100 to 120/200 to 240 VAC ±10%, 50/60 Hz		
Operating environment	Temperature: 10°C to 35°C, Humidity: 35% to 80% R.H. (no condensation)		
Power consumption	115 VA or less		
External dimensions (approx.)	1205 × 1020 × 600 mm (W × H × D) (including stand)		850 × 381 × 169 mm (W × H × D)
Weight (approx.)	48 kg (including stand)		24 kg

*1 Documents up to approximately 4 m in length can be scanned. (Mechanical restriction)
For long-length documents, the document length that can be scanned is limited by the available memory (hard disk or other data storage device) of the host computer to which it is connected, and also by the grade of the medium being scanned.

*2 Carrier sheet thickness: 0.2 mm

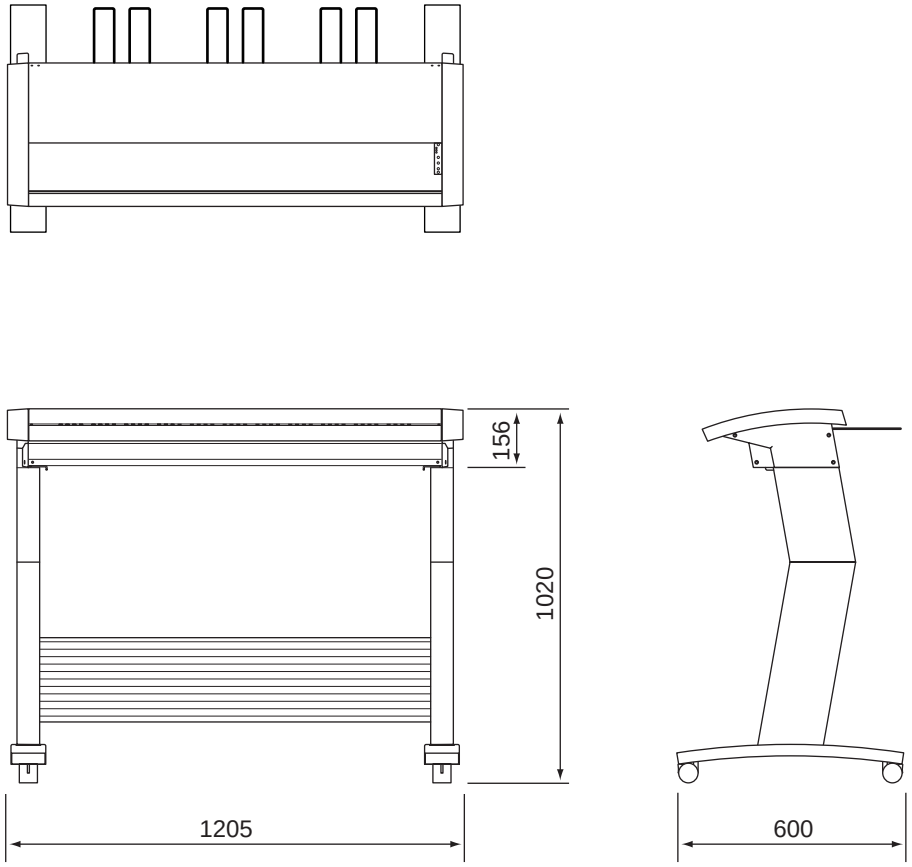
*3 Excluding data-transfer time

*4 Notes on scanning precision
Scanning precision may vary slightly depending on the grade and thickness of the medium being scanned, and on the operating conditions. The precision figures above were measured under the operating conditions described below.

- Test chart used : Mylar sheet (thickness: 55 mm)
- Guaranteed precision conditions : Temperature 20 ±3°C; humidity: 60% ±10% RH
- Guaranteed scanning precision range : 1188 mm × 841 mm

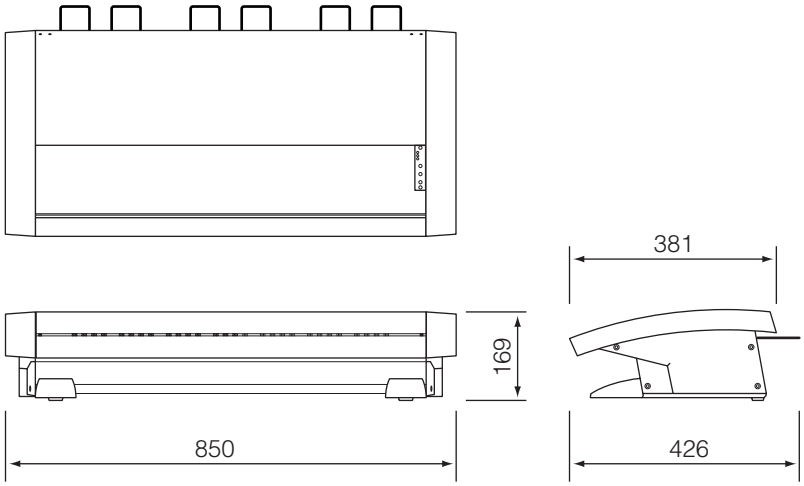
1.3 External View

External Dimensions of the CS1000/CS1000EV

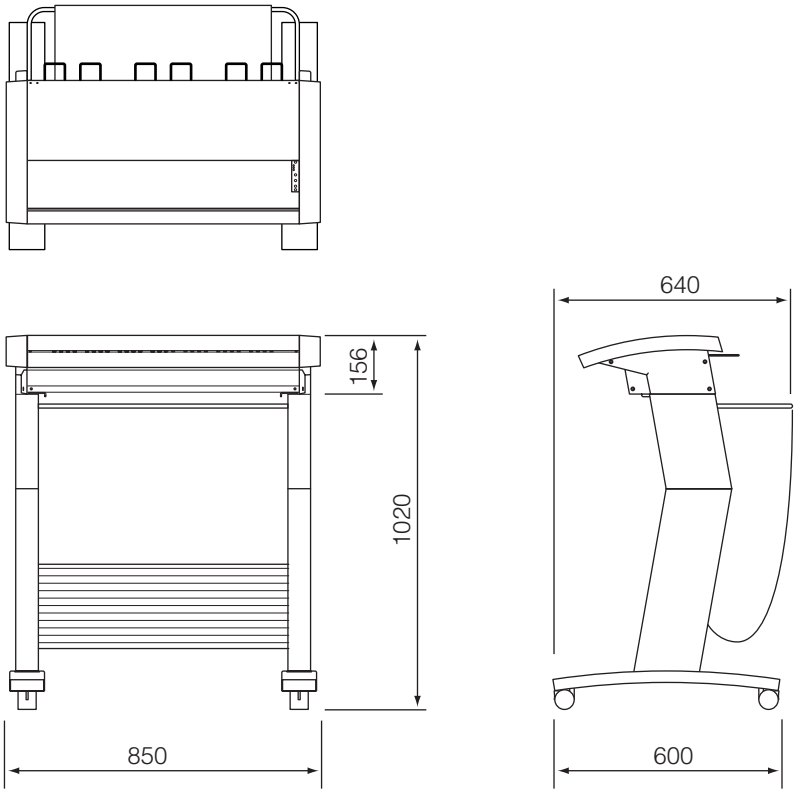


Unit : mm
Dimensional precision error : ±5 mm

External Dimensions of the CS1100EV



When mounted on the optionnal stand



Unit : mm
Dimensional precision error : ±5 mm

1.4 System Requirements

The minimum system requirements for running the scanner's hardware and software are listed below.

- **Operating system:** Windows 95/98/Me, Windows NT 4.0, Windows 2000 or later
- **CPU:** Pentium 133 MHz or higher
- **Memory:** 32 MB or more
- **Monitor:** 1024 × 768 pixels, 256 colors or more
- **Enough disk space to store data**
- **Mouse**
- **SCSI board by Adaptec**

Recommended environment

For binary monochrome data

- **CPU:** Pentium 200 MHz or higher
- **Memory:** 64 MB or more
- **SCSI board by Adaptec (PCI type)**

For grayscale data

- **CPU:** Pentium III 550 MHz or higher
- **Memory:** 256 MB or more
- **Monitor:** 1024 × 768 pixels, High Color or higher resolution
- **SCSI board by Adaptec (PCI type)**

For 8-bit color data

- **CPU:** Pentium III 866 MHz or higher
- **Memory:** 512 MB or more
- **Monitor:** 1024 × 768 pixels, True Color or higher
- **SCSI board by Adaptec (PCI type)**

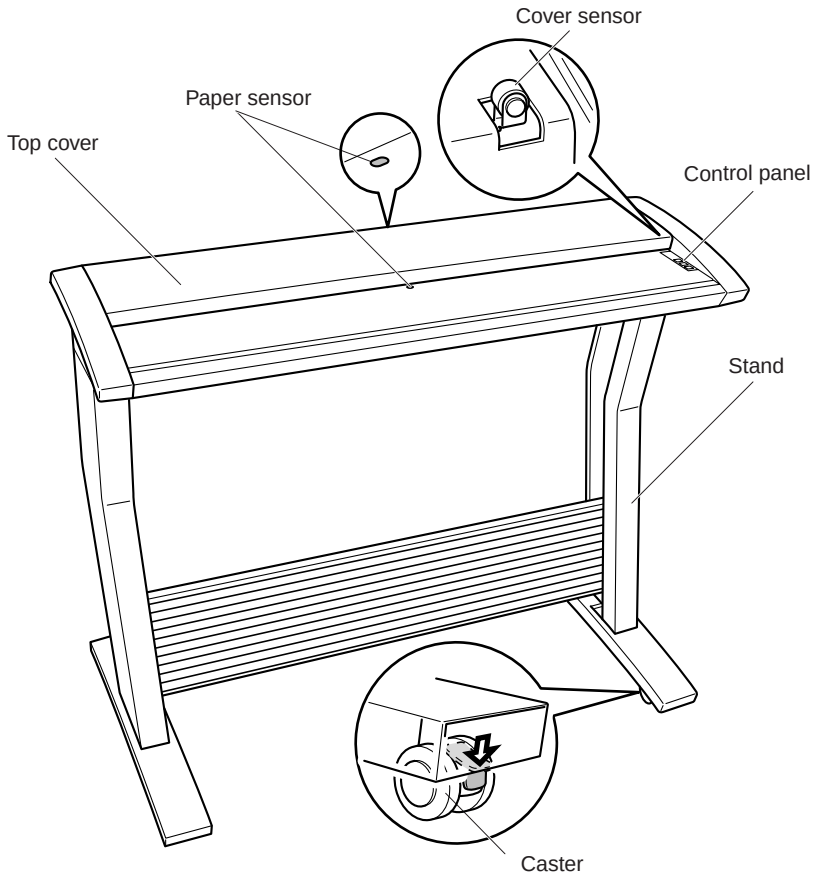
CHECKPOINT

The system configuration should correspond to the recommended specifications listed here, in order to ensure the optimum capabilities of the scanner.
Use with a system configuration below the recommended specifications will affect the scanning speed and prevent the scanner from operating to its specified capabilities.
To edit an A1-size or larger grayscale document with a resolution of 400 dpi or higher, or an 8-bit color document, you may need more than the recommended memory sizes above. Depending on the type of document, you may not be able to scan in the document even if you increase the memory size.

2. PART NAMES AND FUNCTIONS

2.1 Part Names and Functions

Front View



Top cover

Opening the top cover allows the document hold-down unit to be removed.

Cover sensor

This senses whether the top cover is open or closed, and interrupts scanner operation if the top cover is opened during operation.

Stand

The stand unit is assembled for mounting of the scanner unit.

Casters

Release the lock on the casters to allow the unit to be moved.

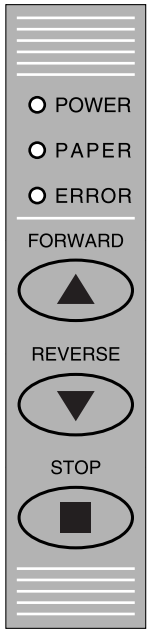
Paper sensor

This senses whether a document is present in the scanner.

⚠CAUTION

Do not touch the cover sensor or paper sensor.

Control panel



POWER LED

Unlit : Is unlit while the scanner is turned off.
Lit : Lights (green) when the scanner is turned and remains lit while it is operating normally.

PAPER LED

Unlit : Normal status (Local status).
Lit : Lights (green) when the scanner enters Scan READY status.
Flashing : Flashes (green) while image data is being scanned.

ERROR LED

Lit : Lights (red) to indicate a hardware error.
Flashing : Flashes (red) when a document is detected during the self-test when the scanner is turned on or when the scanning is suspended by pressing the STOP key.
Unlit : Normal status

FORWARD key

Advances the document into the scanner. When this key is pressed in Scan READY status, the Scan READY status is cancelled and the document is ejected toward the rear of the scanner.

REVERSE key

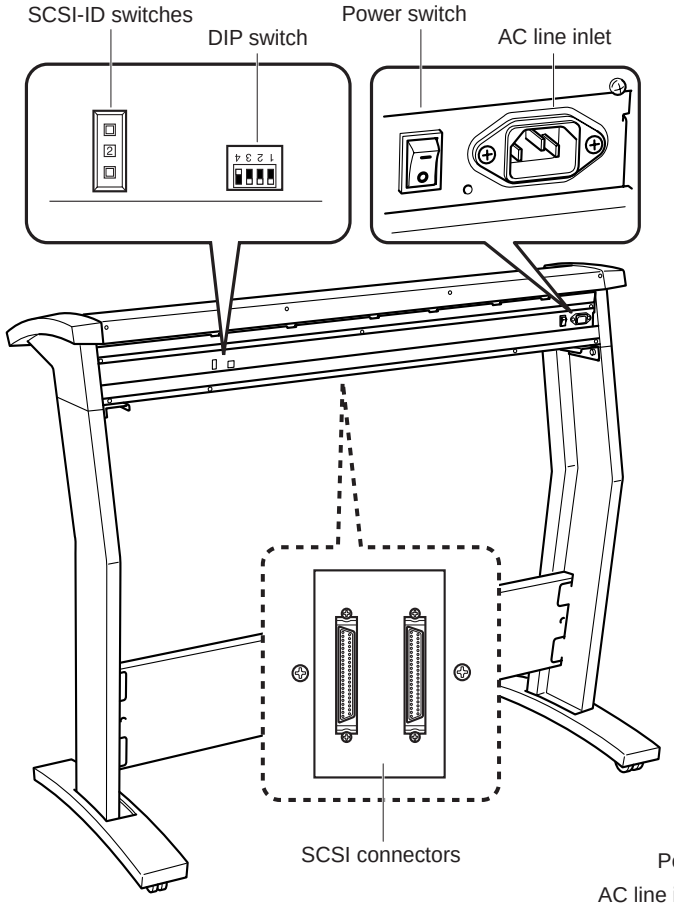
Feeds the document toward you. When this key is pressed in Scan READY status, the Scan READY status is cancelled and the document is ejected toward the front of the scanner.

STOP key

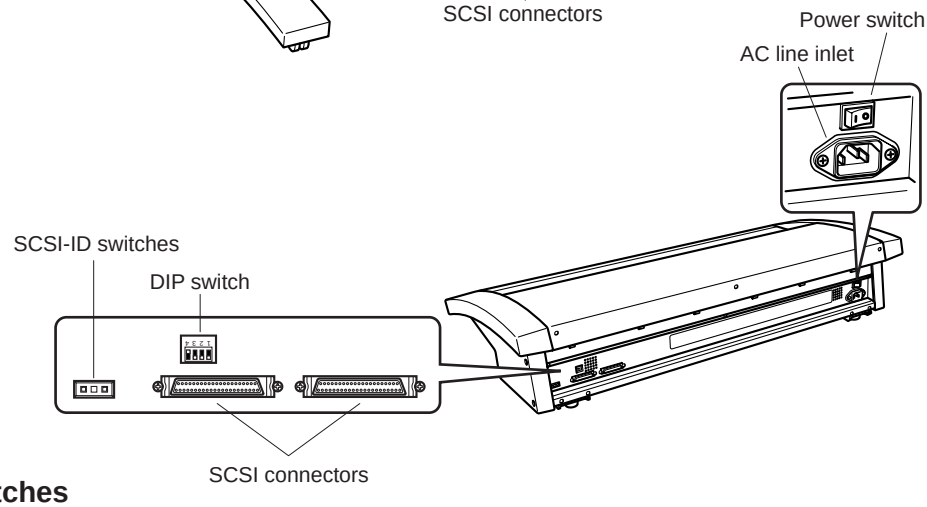
Compulsorily stops scanning of the document.

Rear View

CS1000/1000EV



CS1100EV



SCSI-ID switches

Used to specify the ID numbers of the SCSI interfaces.

DIP switch

Used to set the scanner's functions.

Power switch

Controls the on/off status of the power supply to the scanner.

AC line inlet

Connect the power cord's female plug here.

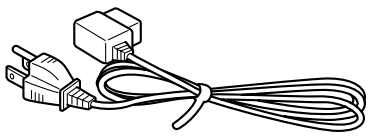
SCSI connectors

Used to connect SCSI interface cables. The two connectors are connected in parallel inside the scanner.

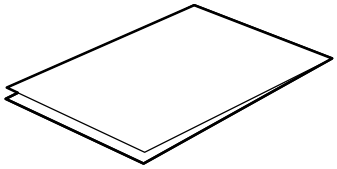
2.2 Unpacking the Scanner

After unpacking the Image Scanner, check its outer casing and check that the standard accessories listed below are all present. If you detect a surface flaw or a missing accessory, please promptly contact your sales representative or nearest Graphtec vendor.

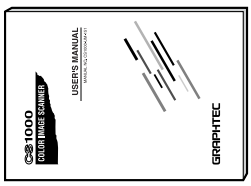
Power cable 1



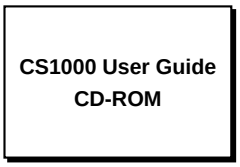
Carrier sheet (IS0902) 1



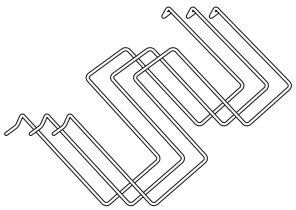
User's Manual 1



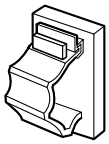
CS1000 User Guide CD-ROM 1



Document support wires 1



Cable clamp 1

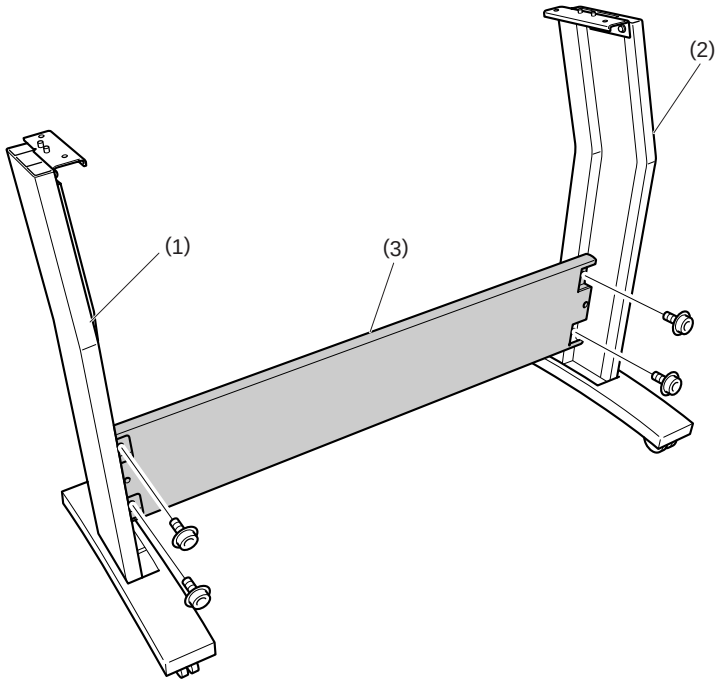


3. PREPARING TO OPERATE THE SCANNER

3.1 Assembling the Scanner

Assemble the stand before mounting the scanner unit. Eight bolts and an Allen wrench are provided with the stand.

(1) Using the four bolts, loosely attach the center bar (3) to side stay R (1) and side stay L (2).



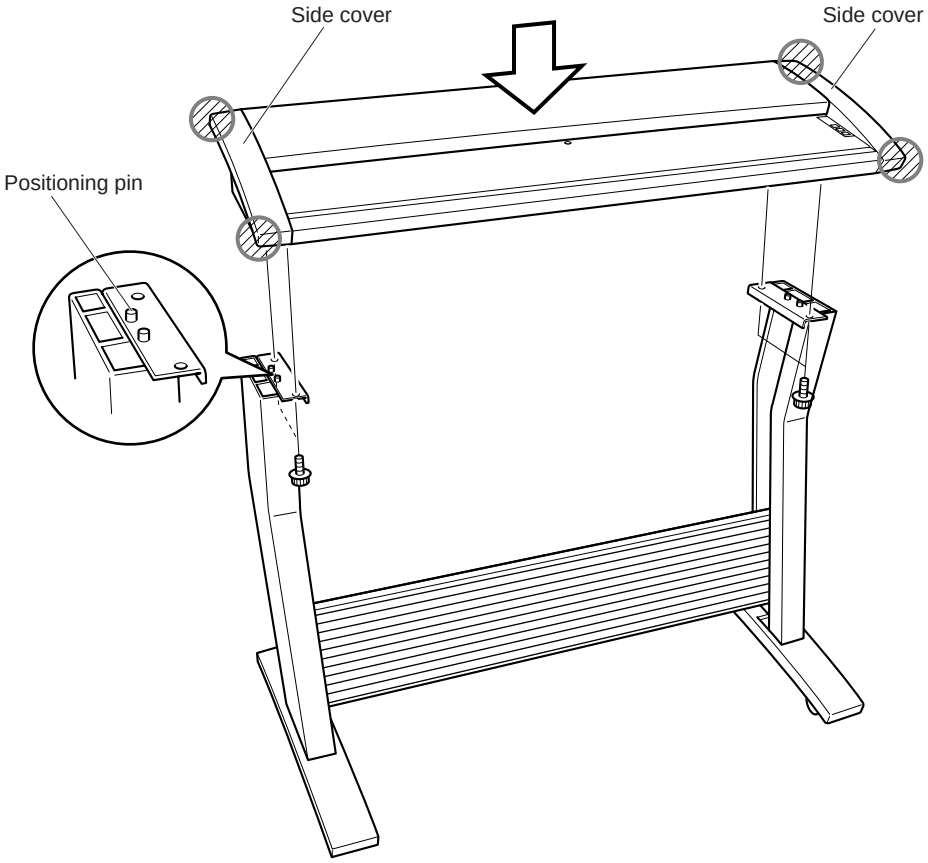
TIP

Attach the center bar loosely. Tighten the bolts securely after the scanner unit has been mounted on the stand.

(2) Hold the scanner unit by the side covers on both sides, and mount the scanner so that the positioning pins on the stand align with the positioning holes on the underside of the scanner. Secure using the four bolts.

⚠CAUTION

Holding the scanner by the rear part of the top cover may cause damage to the scanner or to the person doing the installation. Always hold the scanner by the side covers, at the positions indicated by the shaded circles ▨ in the figure below.

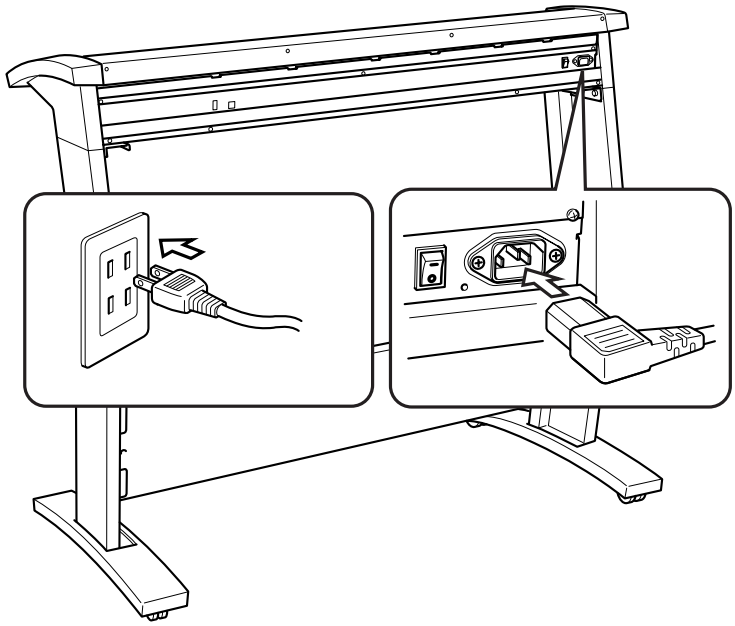


(3) Fully tighten the four bolts on the center bar to secure the side stays (see the diagram for step (1)).

(4) Before beginning scanner operation, be sure to remove the plastic sheet from the bottom of the document hold-down unit. Please refer to Section 8.2 “Document Hold-Down Unit” for the removal and mounting procedures.

3.2 Connecting the Scanner to a Power Supply

Insert the female plug of the power cord provided into the scanner's AC line inlet and insert its male plug into an electrical socket supplying AC voltage.
Check that the scanner's Power switch remains in the Off position until the connection of both the power cable and SCSI interface cable has been completed.



CHECKPOINT

Ensure that the scanner's Power switch is in the Off position.

3.3 Connecting the SCSI Cable

Obtain a SCSI interface cable (optional) that is compatible with the computer to be connected.

Compatible Cables

- The cable must have half-pitch pin-type 50-pin connectors.
- To connect multiple SCSI devices in a daisy-chain* arrangement, the total cable length must be no longer than three meters.
- Among Graphtec cables, the SC0006 or SC0006 2M model can be used (depending on the shape of the connector on the computer's SCSI interface board).

TIP

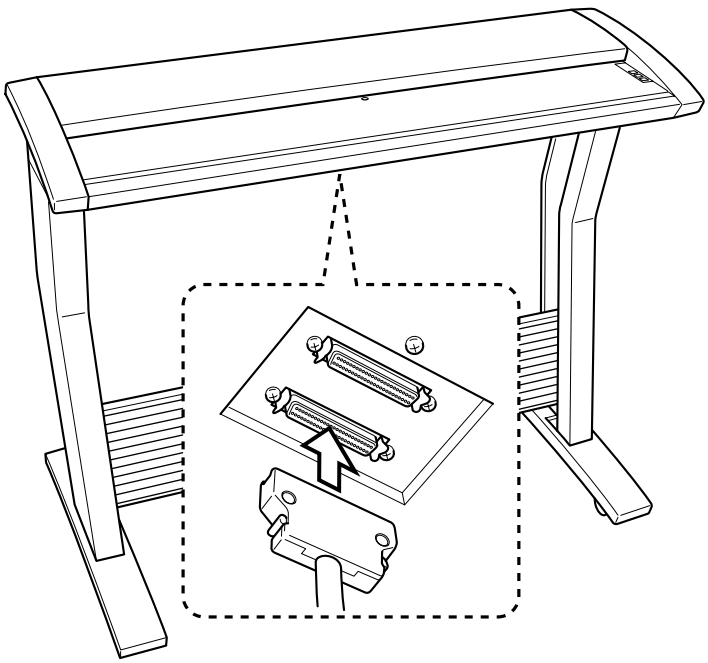
*** Daisy-chain:** A method for connecting peripheral devices in a ring arrangement

⚠CAUTION

The use of an incompatible cable may cause the scanner to malfunction or damage the interface.
If the cable comes into contact with the document, use the cable clamp provided as a standard accessory to fasten the cable to the underside of the scanner.

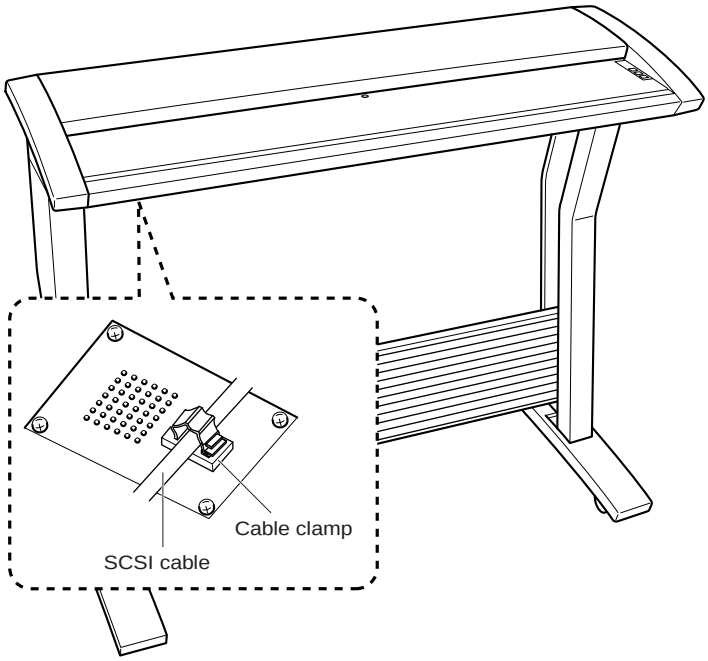
Connection Procedure

(1) Insert one end of the SCSI cable's into one of the two SCSI connectors on the scanner's rear panel.



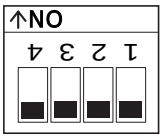
* Firmly insert the cable's connector into the scanner's SCSI connector until it locks into place.

(2) If the SCSI cable comes into contact with the document, use the cable clamp provided as a standard accessory to fasten the cable to the underside of the scanner, at either the left or right side.



(3) Insert the cable's other end into the computer's connector.

(4) If this scanner will be a terminal within the network configuration, set Bit 4 of the DIP switch on the scanner's rear panel to enable the internal terminator function.



		DIP switch's bits			
		4	3	2	1
Terminator	Disable	ON			
	Enable	OFF			
			Usually OFF		

⚠CAUTION

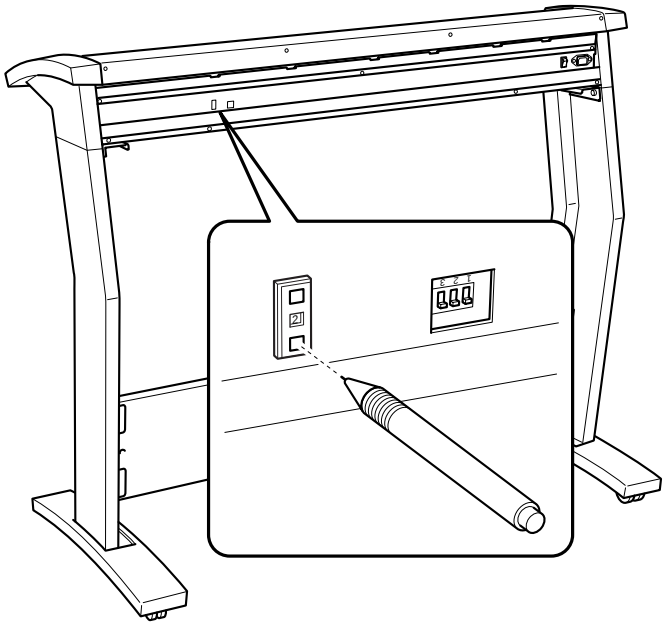
Turn off the scanner before changing a DIP switch setting.

NOTE

The scanner comes with the Terminator setting of "Enable" as its factory-preset default.

3.4 Setting the ID Number

The SCSI bus is designed to allow up to eight devices to be connected at the same time. As a result, a single computer can be used to exchange data with multiple SCSI devices, including a scanner and disk drives. Each device must be assigned an ID number (device number) to enable the devices to be distinguished on the SCSI bus.
Using a mechanical pencil or other pointed object at the SCSI-ID switches on the scanner's rear panel, set the scanner's ID number that corresponds to the host computer's applications.



- The ID can be set from 0 to 7.
- The scanner's default ID number is 2.

If the host computer cannot communicate with the scanner, first check that both of the SCSI cable's connectors are firmly inserted. Note that the host computer and scanner cannot communicate if the scanner shares the same ID as another device or its ID does not correspond to the host computer's applications.
The ID number for the host computer is normally 7.

⚠CAUTION

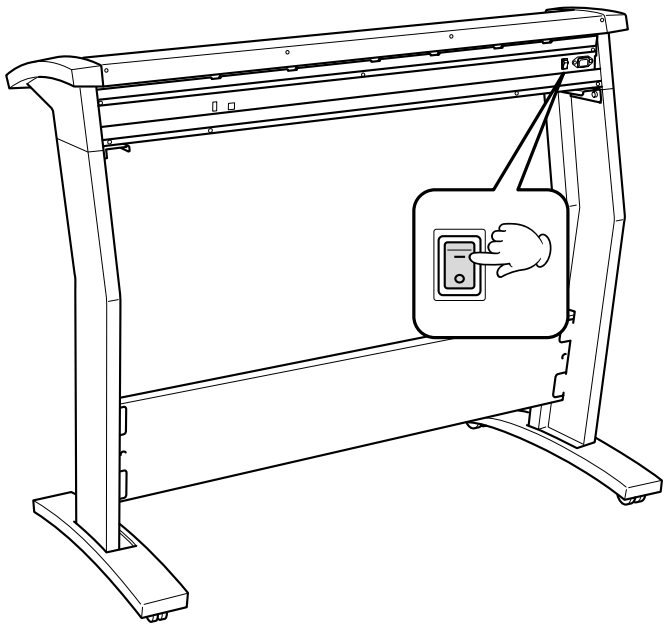
Turn off the scanner before setting the SCSI-ID number.

CHECKPOINT

The scanner comes with the default SCSI-ID number of 2.

3.5 Turning the Scanner On or Off

Whenever the scanner's Power switch is turned on, the POWER, PAPER, and ERROR lamps on the control panel light up. When the scanner has been initialized, the POWER lamp lights up.



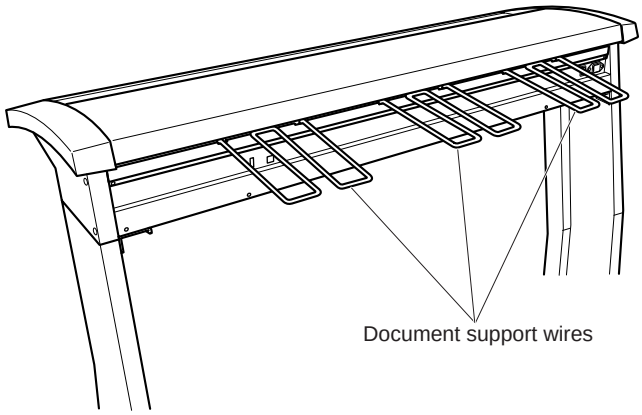
CHECKPOINT

When resetting the scanner by turning it off then back on again, wait at least three seconds before turning it back on.

3.6 Attaching the Document Support Wires

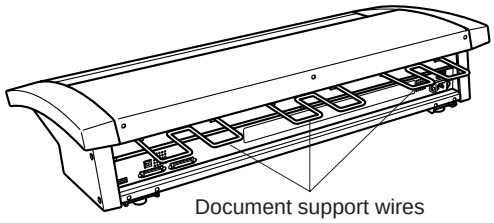
The document support wires should be attached to the CS1000EV when scanning carrier sheets or heavy documents.

CS1000/1000EV



The document support wires should always be attached to the CS1100EV regardless of the type of document being scanned.

CS1100EV

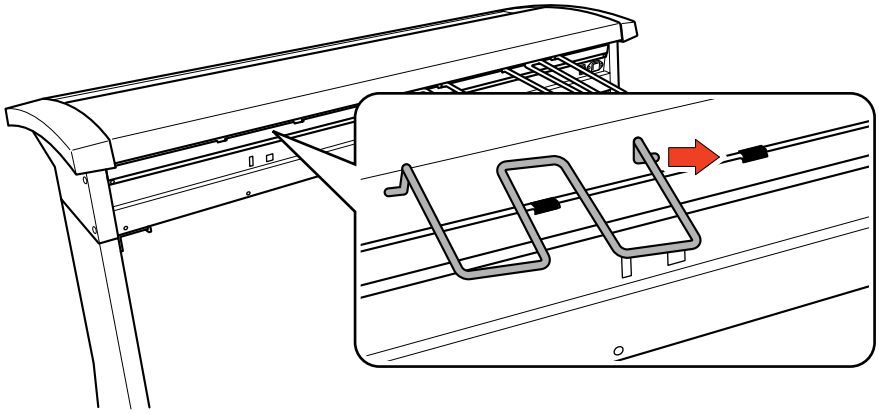


⚠CAUTION

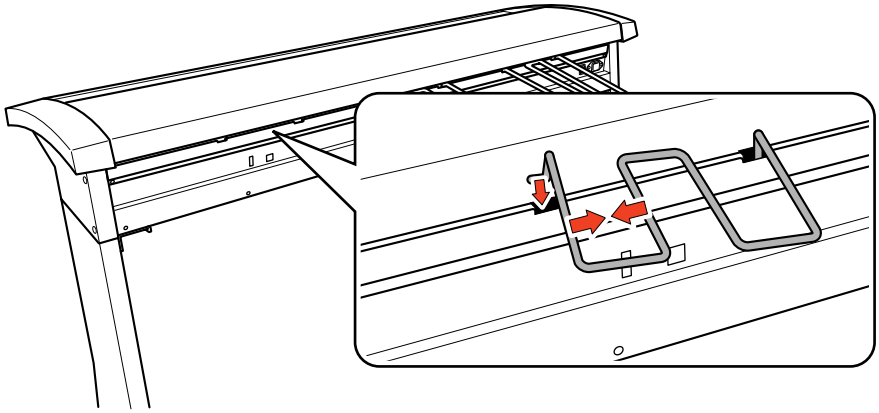
The CS1100EV must always be used with the document support wires attached.
Scanning without using the document support wires may damage the document if it comes into contact with the SCSI cable.

Attaching the document support wires

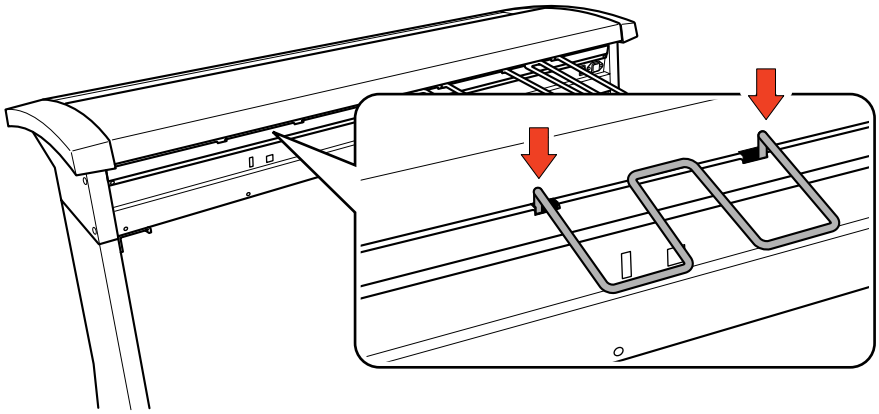
(1) Insert one end of the document support wire provided into the hole at the rear of the scanner.



(2) Squeeze the document support wire and insert the other end.



(3) Press down on both sides of the document support wire.



(4) Attach the other document support wires in the same manner.

⚠CAUTION

Detach the document support wires when moving or packing the scanner. To remove the document support wires, squeeze gently and lift up.

3.7 Document Hold-down Unit EV

The document hold-down unit EV should be used according to the type of documents being scanned.
The document hold-down unit EV is normally stored on the center bar of the stand and should be used in place of the standard document hold-down unit when required.
The document hold-down unit EV should be used for the following types of documents.

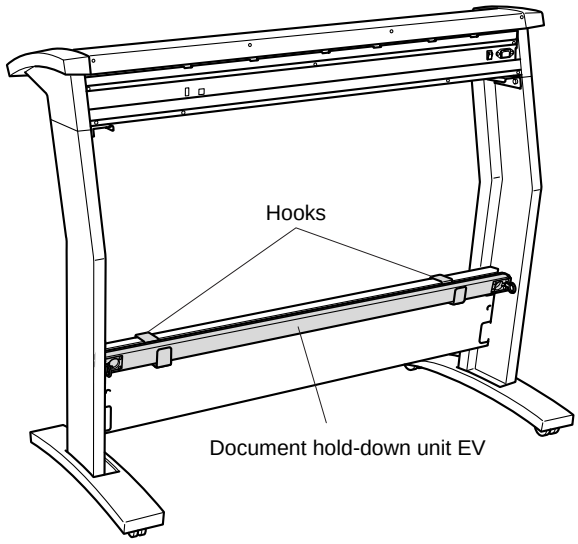
- Plain paper more than 0.08 mm thick with prominent folds or curling that is likely to affect scanning quality.

⚠CAUTION

Do not use the document hold-down unit EV when scanning thin or limp documents such as plain paper less than 0.08 mm thick. This may result in damage to the document and paper jamming.
The document hold-down unit EV uses a greater document restraining force than the standard document hold-down unit. Some types of documents may be more susceptible to damage.
Use a carrier sheet when scanning film.
The scanning precision is different from that using the standard document hold-down unit, and so distance correction may be necessary.

Storing the Document Hold-down Unit EV

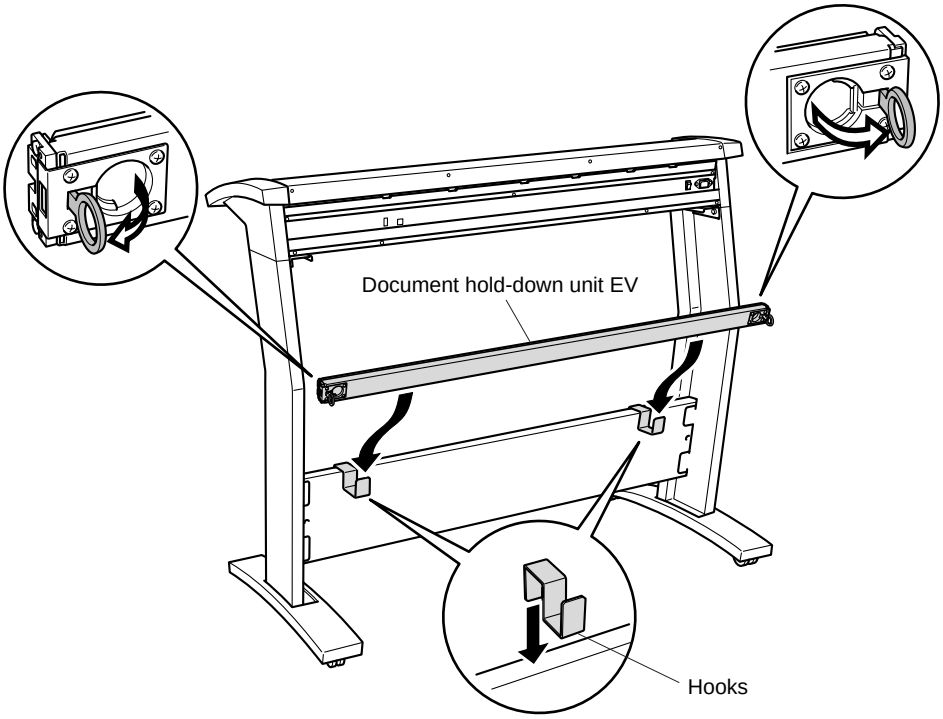
- Store the document hold-down unit EV by attaching it to the hooks on the center bar of the stand (for CS1000EV and CS1100EV with stand *).
- For the CS1100EV with no stand, store the document hold-down unit EV in the cardboard box in which it was packed.



Attaching the hooks (for CS1000EV and CS1100EV with stand *)

(1) Hook the rear of the hooks provided over the center bar of the stand. (Refer to diagram below.)

(2) Store the document hold-down unit EV by mounting it on the hooks with its handles opened outward.



* The CS1100EV stand is optional.

Replacement method

Detach the document hold-down unit currently fitted and replace it with the document hold-down unit EV. (Refer to sections 8.2, "Document Hold-down Unit".)

Distance correction method

Distance correction can be performed via the driver software. In the ScanningMaster 21+ driver software provided, run distance correction from the "Tools/Scanner Adjustment" menu to adjust the scanning precision.

CHECKPOINT

The handles at both ends of the document hold-down unit EV are silver, whereas the handles at the ends of the standard document hold-down unit are black. Take care to ensure that the correct document hold-down unit is used.
The document hold-down units are symmetrical and can be fitted either way round. However, they are factory adjusted, and installing left-to-right may cause paper jamming.
Always check the directions indicated by labels on the document hold-down units and scanner when installing.
Insert the document hold-down unit fully. If the document hold-down unit is not fully down, it will cause reduced image quality or paper jamming.

4. OPERATION AND CONNECTION

4.1 Connecting the Scanner to a Computer

Before you can start connecting the scanner to the computer, you need to prepare (confirm) the computer system's environment.

(1) Confirm that the computer's operating system has been properly installed.

(2) Confirm that a SCSI adapter has been connected to the computer.

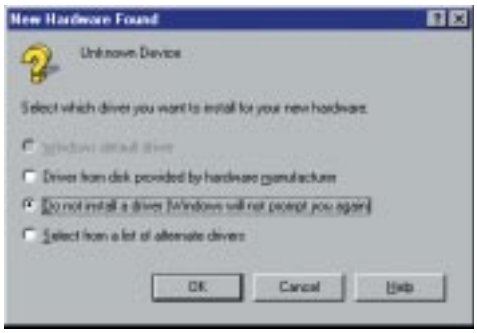
(3) Confirm that the SCSI driver has been installed in the computer.

Connecting the CS1000 to a Computer for the First Time

■ For Windows 95 or Windows 95 Version a:

(1) After checking that the scanner and the computer are properly connected via the SCSI interface cable, turn on the scanner first and then turn on the computer.

(2) When Windows 95 has been booted, the window below appears.


New Hardware Found
Unknown Device
Select which driver you want to install for your new hardware.
Driver from disk provided by hardware manufacturer
Do not install a driver (Windows will not prompt you again)
Select from a list of alternate drivers
OK
Cancel
Help

(3) Select "Do not install a driver," then click the "OK" button.

(4) The Windows 95 Desktop appears and the CS1000 is acknowledged by the computer.

■ For Windows 95 Version B:

(1) After checking that the scanner and the computer are properly connected via the SCSI interface cable, turn on the scanner first and then turn on the computer.

(2) When Windows 95 has been booted, the window below appears.

(3) Click the Next button to initiate the computer's search for a new driver.

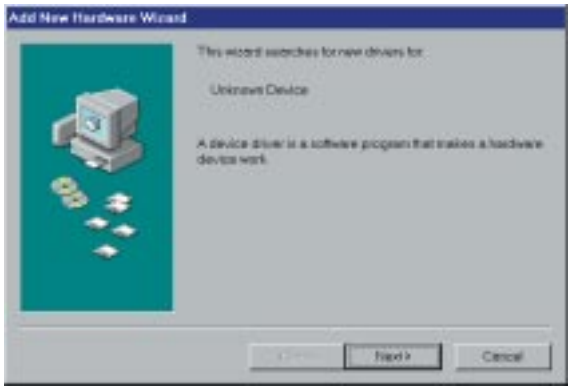
(4) When the new driver has been detected, the menu below appears. Click the Finish button.

(5) The Windows 95 Desktop appears and the CS1000 is acknowledged by the computer.

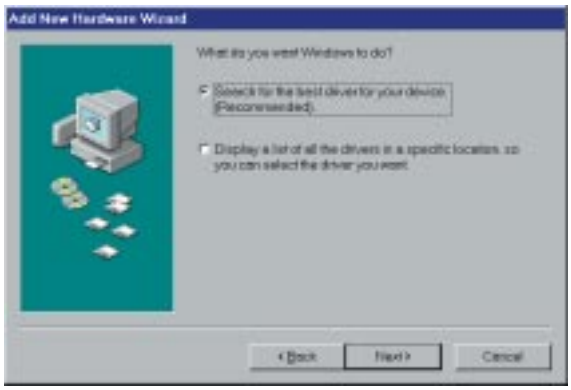
■ For Windows 98:

(1) After checking that the scanner and the computer are properly connected via the SCSI interface cable, turn on the scanner first and then turn on the computer.

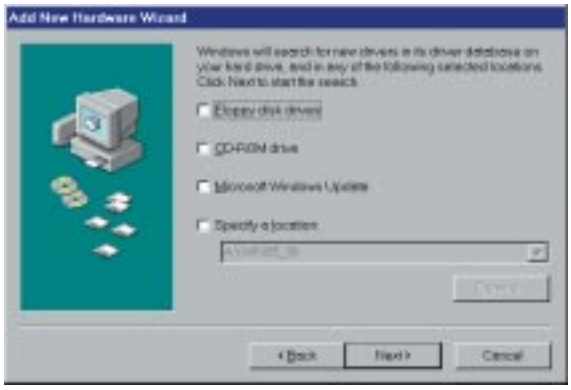
(2) When Windows 98 has been booted, the window below appears.



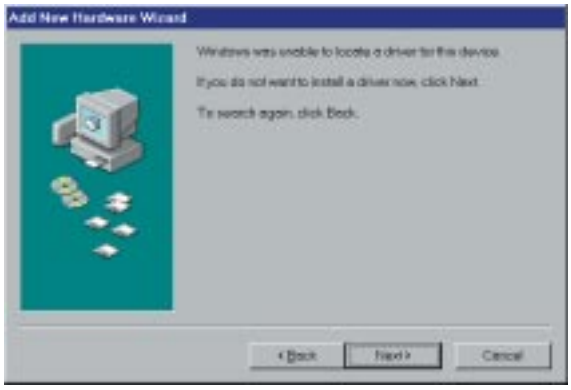
(3) Click the Next button.


Add New Hardware Wizard
What do you want Windows to do?
Search for the best driver for your device. (Recommended).
Display a list of all the drivers in a specific location, so you can select the driver you want.
< Back
Next >
Cancel

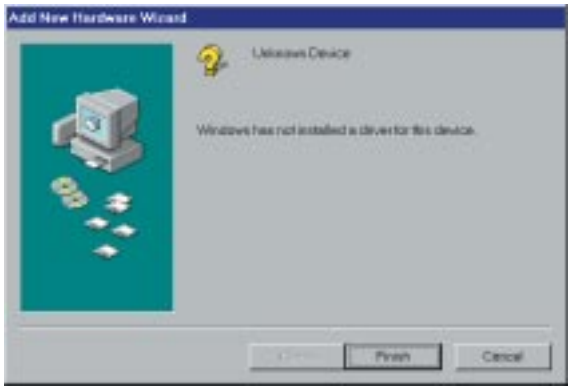
(4) Point to “Search for the best driver for your device” and then click the Next button.


Add New Hardware Wizard
Windows will search for new drivers in its driver database on your hard drive, and in any of the following selected locations. Click Next to start the search.
Floppy disk drives
CD-ROM drive
Microsoft Windows Update
Specify a location:
< Back
Next >
Cancel

(5) Remove the check marks from all boxes and then click the Next button.


Add New Hardware Wizard
Windows was unable to locate a driver for this device.
If you do not want to install a driver now, click Next.
To search again, click Back.
< Back
Next >
Cancel

(6) Click the Next button.



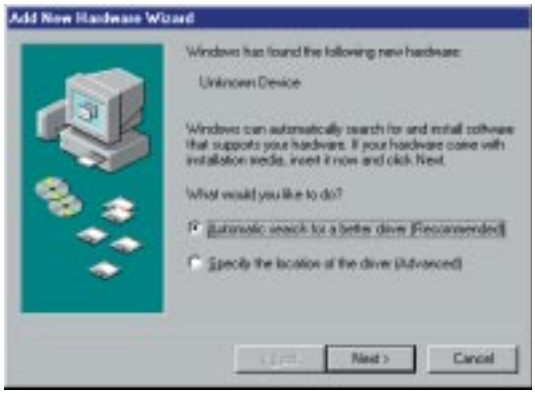
(7) Click the Finish button.

(8) The Windows 98 Desktop appears and the CS1000 is acknowledged by the computer.

■ For Windows ME:

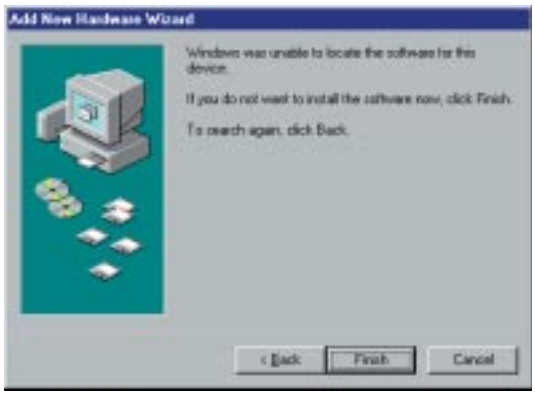
(1) Connect the CS1000 to the computer, turn on the CS1000 first, and then turn on the computer.

(2) Once Windows Me has started up, the window shown below is displayed.


Add New Hardware Wizard
Windows has found the following new hardware:
Unknown Device
Windows can automatically search for and install software that supports your hardware. If your hardware came with installation media, insert it now and click Next.
What would you like to do?
Automatic search for a better driver (Recommended)
Specify the location of the driver (Advanced)
< Back
Next >
Cancel

(3) Click on “Next” to search for the driver.

(4) Upon completion of the search for the driver, the window shown below is displayed. Click on the “Finish” button.


Add New Hardware Wizard
Windows was unable to locate the software for this device.
If you do not want to install the software now, click Finish.
To search again, click Back.
< Back
Finish
Cancel

(5) The Windows Me desktop is displayed, and the CS1000 is recognized by the computer.

■ For Windows NT 4.0:

(1) After checking that the scanner and the computer are properly connected via the SCSI interface cable, turn on the scanner first and then turn on the computer.

■ For Windows 2000

(1) After connecting the CS1000 to the computer, turn on the CS1000 and then turn on the computer.

(2) When Windows 2000 boots, the message below appears.

(3) Next, the Found New Hardware Wizard appears.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install a device driver for a hardware device.
To continue, click Next.
< Back
Next >
Cancel

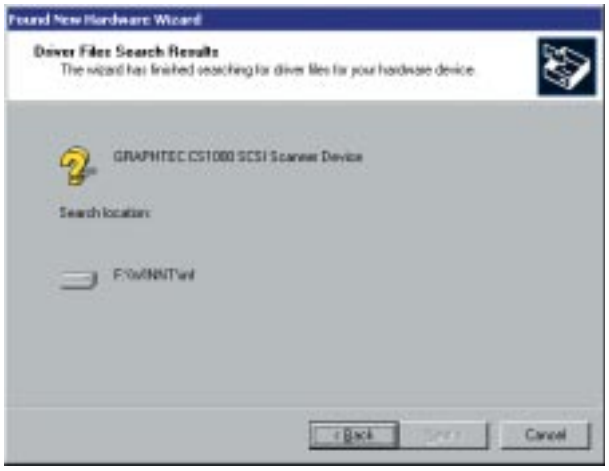
(4) Click the Next button to proceed to the menu for installing the driver.

Found New Hardware Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard will complete the installation for this device:
GRAPHTEC CS1000 SCSI Scanner Device
A device driver is a software program that makes a hardware device work. Windows needs driver files for your new device. To locate driver files and complete the installation click Next.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel

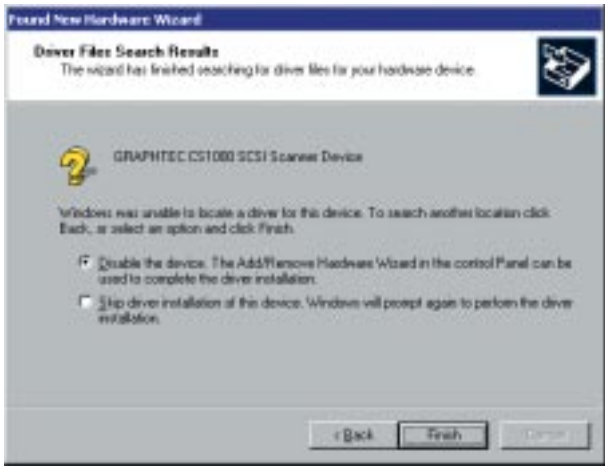
(5) Click the Next button to proceed to the Locate Driver Files menu shown below.

Found New Hardware Wizard
Locate Driver Files
Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
GRAPHTEC CS1000 SCSI Scanner Device
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
Floppy disk drives
CD-ROM drives
Specify a location
< Back
Next >
Cancel

(6) Click the Next button to start searching for the driver files.



(7) When the wizard has finished its search, the menu below appears.


Found New Hardware Wizard
Driver Files Search Results
The wizard has finished searching for driver files for your hardware device.
GRAPHTEC CS1000 SCSI Scanner Device
Windows was unable to locate a driver for this device. To search another location click Back, or select an option and click Finish.
Disable the device. The Add/Remove Hardware Wizard in the control Panel can be used to complete the driver installation.
Skip driver installation of this device. Windows will prompt again to perform the driver installation.
< Back
Finish

Insert a check in the “Disable the device” box, then click the Finish button.

(8) The Windows 2000 Desktop appears and the CS1000 is acknowledged by the computer.

4.2 Checking the Interface Connection

CHECKPOINT

If the scanner is connected to a system with Adaptec EZ-SCSI DELUXE* installed, the scanner will be recognized under “Scanner” in the Device Manager.

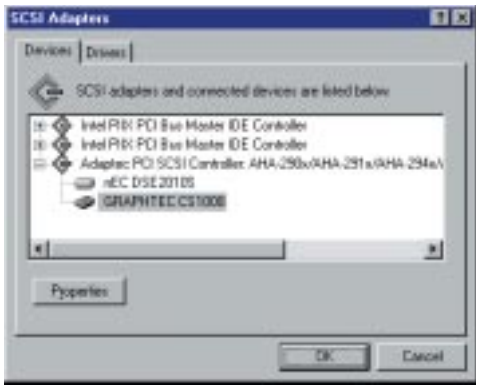
* EZ-SCSI DELUXE is the software included with the SCSI adapter. For details, see the SCSI adapter instruction manual.

■ For Windows 95/98/Me

Open the System window from within the Control Panel in My Computer.
Click on the Device Manager tab to display the list of installed devices. Confirm that the CS1000 is recognized under “Other devices.”

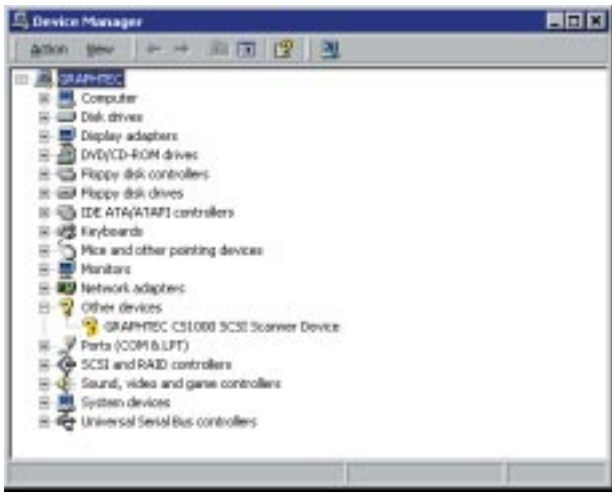
■ For Windows NT 4.0:

From the Control Panel window in the My Computer folder, boot the SCSI adapter. Select the SCSI adapter that is connected to the scanner by double-clicking it, then check that the scanner (CS1000) is listed below the SCSI adapter and is thus acknowledged.



■ For Windows 2000

From the Control Panel folder in the My Computer directory, select the System icon. Next, click the Hardware tab and then click the Device Manager button to display a list of the installed devices.
Check that the CS1000 scanner is acknowledged by the computer under “Other devices.”



4.3 Installing the Scanning Master 21+ Application

The Scanning Master 21+ “OPS112” is a software application for using a Graphtec scanner to scan image data. The OPS112 User’s Manual is contained in the file name “OPS112-1.pdf”.

Operating Environment

Windows 95/Windows 98/Windows Me, Windows NT 4.0, or Windows 2000.

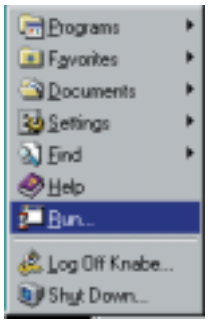
Installation Procedure

(The following steps are explained using the Windows 95 windows.)

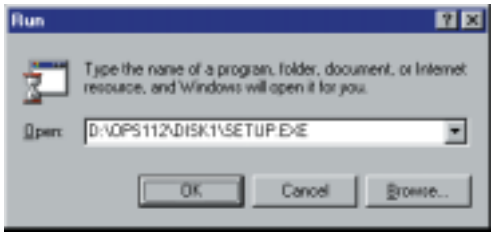
(1) Boot Windows 95.

(2) Insert the CS1000 User Guide CD-ROM containing the OPS112 program files into the computer’s CD-ROM drive.

(3) Click the Taskbar’s Start button, then click the Run... icon.



(4) Enter the CD-ROM drive name and OPS112\DISK1\SETUP.EXE as the name of the file you wish to open. If the disk is in drive D, for example, enter “D:\OPS112\DISK1\SETUP.EXE” in the box.



(5) Click the OK button to run the OPS112 setup program. From this point on, follow the setup program’s instructions to install the OPS112 application.

- If the application has been properly installed, “Scanning Master 21+” will be newly listed in the Program menu accessed from the Start button.

NOTE

For more details, open the README.TXT file provided in the “Scanning Master 21+” folder.

4.4 Installing the Scanning Master Copy Color Application

The Scanning Master Copy Color “OPS116” is a software application for outputting image data scanned in by a Graphtec scanner to a plotter or printer.

Operating Environment

Windows 95/Windows 98/Windows Me, Windows NT 4.0, or Windows 2000.

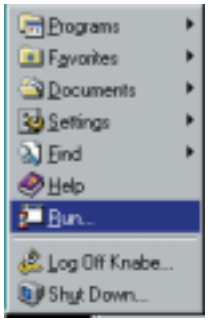
Installation Procedure

(The following steps are explained using the Windows 95 windows.)

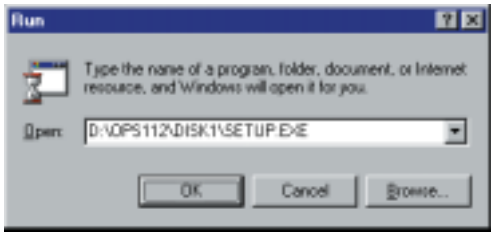
(1) Boot Windows 95.

(2) Insert the CS1000 User Guide CD-ROM containing the OPS116 program files into the computer’s CD-ROM drive.

(3) Click the Taskbar’s Start button, then click the Run... icon.



(4) Enter the CD-ROM drive name and OPS116\DISK1\SETUP.EXE as the name of the file you wish to open. If the disk is in drive D, for example, enter “D:\OPS116\DISK1\SETUP.EXE” in the box.



(5) Click the OK button to run the OPS116 setup program. From this point on, follow the setup program’s instructions to install the OPS116 application.

- If the application has been properly installed, “Scanning Master Copy Color” will be newly listed in the Program menu accessed from the Start button.

NOTE

For more details, open the README.TXT file provided in the “Scanning Master Copy Color” folder.

4.5 Document Types Compatible with the CS1000

Because the CS1000 scans a document while feeding it, the document types that it can scan are subject to the following restrictions.

Compatible Media Widths for Scanning

Documents with a maximum width of 1000 mm

Size	ISO	Size	ANSI
A4	210 mm × 297 mm	A	8.5 in × 11 in
A3	297 mm × 420 mm	B	11 in × 17 in
A2	420 mm × 594 mm	C	17 in × 22 in
A1	594 mm × 841 mm	D	22 in × 34 in
A0	841 mm × 1189 mm	E	34 in × 44 in

Compatible Media Lengths for Scanning

When loaded in the usual manner, a document with a maximum length of 4 meters can be scanned (due to restrictions such as the computer's available memory, the hard disk's storage capacity, and so on).

Compatible Grades & Thickness for Scanning

Media Grades

The scanning precision is guaranteed for high-grade tracing paper (see "Operating environment" in Section 1.2, "Standard Specifications").

Other compatible media types are listed below.

High-grade paper : 60 g/m^2
Tracing paper : 50 to 55 g/m^2
Mylar : 50 mm
Copy paper
Diazo photo-sensitive paper

Media Thicknesses

Observe the following points when scanning a thick medium.

- The CS1000 cannot scan a document that is thicker than 1.5 mm.
- When using the carrier sheet, ensure that the combined thickness of both the document and carrier sheet does not exceed 1.5 mm.
- The carrier sheet alone is 0.2 mm thick.

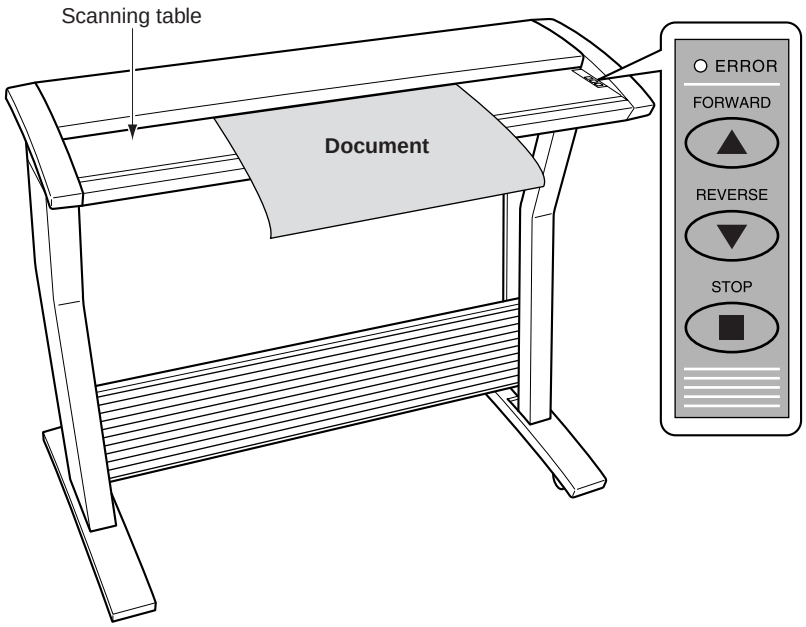
4.6 Loading a Document

For standard-size documents

Insert the document into the document-scanning table with the face to be scanned facing downward, so that it is aligned with the center section, to ensure that it is not scanned at an angle. The two modes described below are provided for loading the document (set from the driver software).

- The rollers start rotating after a preset delay time after the document is inserted, to automatically advance the document to the initial position for scanning.
- The rollers start rotating when the FORWARD switch is pressed on the control panel after the document is inserted, to automatically advance the document to the initial position for scanning (manual loading).

To reposition the document, press the REVERSE switch to remove it, and load it again.



CHECKPOINT

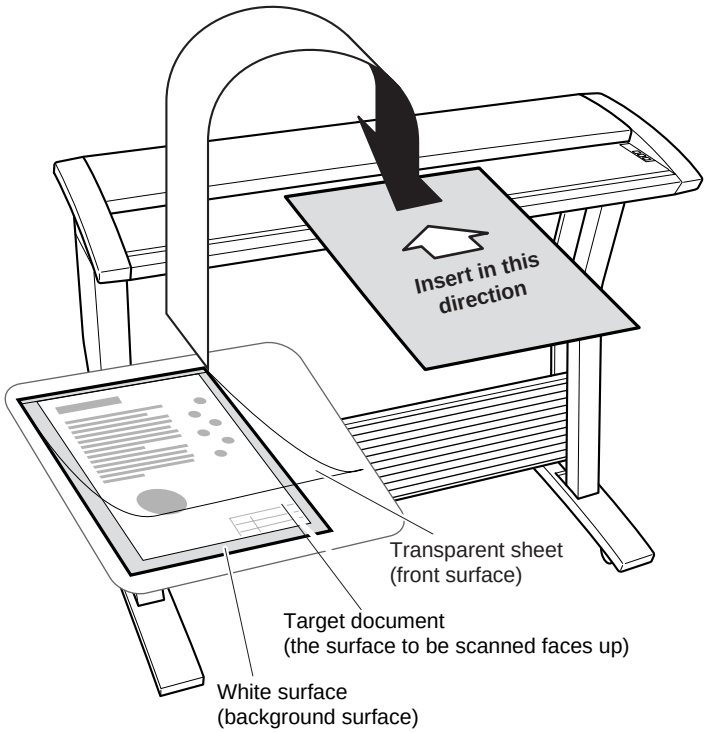
After the CS1000 is turned on and the driver settings have been enabled in the Scan window, it waits for approximately two seconds before beginning the specified scan operation.
Load the document in the scanner with the face to be scanned facing downward.
Do not place anything other than the document to be scanned on the scanning table, as the scanner rollers may start rotating, which is extremely dangerous.
The document may not be fed in correctly if it is curled. The carrier sheet provided should be used for curled documents (see “4.7 Using the Carrier Sheet” for details).
Load the document in the center of the scanner, as the document may be fed in at an angle and not scanned correctly if it is significantly off-center.

4.7 Using the Carrier Sheet

Use the carrier sheet according to the condition of the document to be scanned.
In the case of scanning the following types of media, always place the document on the carrier sheet before loading it into the scanner.

- To scan a medium that is as limp as or limper than a newspaper
- To scan paper that is badly curled
- To scan a document that is smaller than A4 size or a document of non-standard size
- To scan a medium that tears easily
- When the target document cannot be properly advanced to the initial position of scanning (because the target document is folded, wrinkled, or otherwise hard to load in the scanner)
- To scan transparent or translucent documents

As shown in the figure below, place the document in the carrier sheet with the document's surface to be scanned facing up (against the transparent top sheet). For scanning, load the carrier sheet into the scanner with the document's target surface (the transparent top sheet) facing down.


Insert in this direction
Transparent sheet (front surface)
Target document (the surface to be scanned faces up)
White surface (background surface)

CHECKPOINT

When handling the carrier sheet, be very careful not to scratch it or otherwise damage it.

4.8 Scanner Driver Software's Compatibility with Windows 2000

Precautions for installing scanner driver software (Scanning Master, TWAIN32) on your PC to run under Windows 2000

Running the scanner driver software under Windows 2000 requires the ASPI Manager in addition to the SCSI board driver software (provided with Windows 2000). This software is to be supplied by Adaptec.

4.9 How to Obtain (Install) the ASPI Manager

1. What you will need

(1) Copy of the warranty accompanying the purchased SCSI board

(2) ASPI layer update software available at the Adaptec website
You can find this software or “ASPI32.EXE” among updates at the http://www.adaptec.com/worldwide/support/driverdetail.html?filekey=aspi32.exe.

2. How to obtain ASPI Manager

ASPI Manager for Windows 2000 will be available at the Adaptec website.
You can find this software at the http://www.adaptec.com.

3. How to install ASPI Manager

(1) Install the SCSI card in your PC.

(2) Install programs in the floppy disk from Adaptec into Windows 2000.
To do this, double-click “Setup32.exe” in the floppy disk.

(3) Use the update software obtained in Step (2) of Section 1 to update the ASPI layer.

When you are finished, you are ready to run the scanner driver.

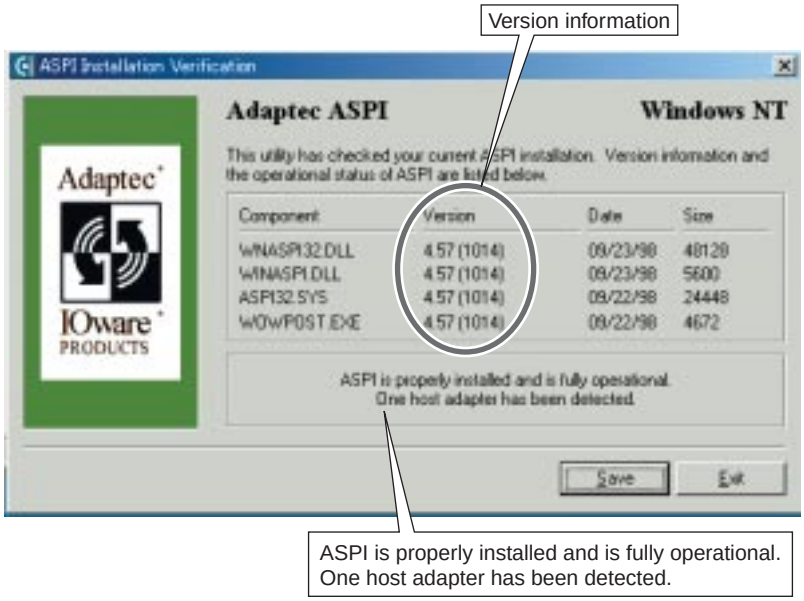
4.10 Checking the ASPI Layer

You can follow the steps given below to check whether the ASPI layer is compatible with Windows 2000.

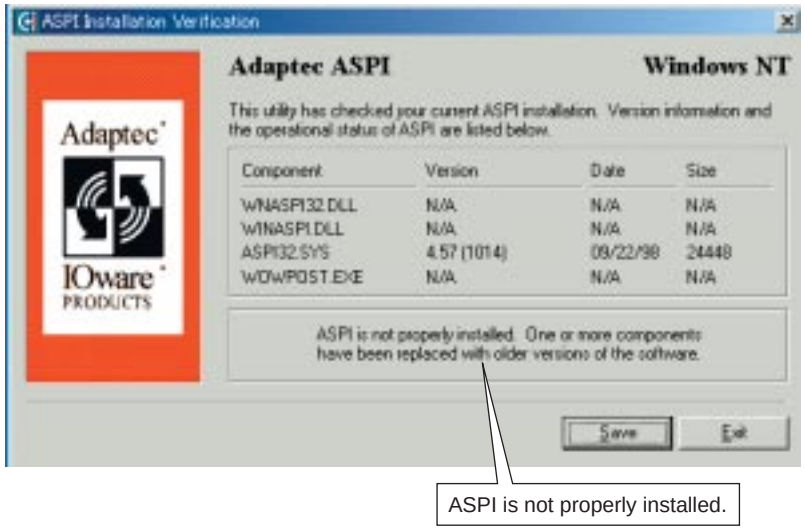
(1) Download the ASPICHK.EXE file from the Adaptec website at http://www.adaptec.com/worldwide/support/driverdetail.html?filekey=aspichk.exe.

(2) Start your PC and run “ASPICHK.EXE.”

Compatible with Windows 2000

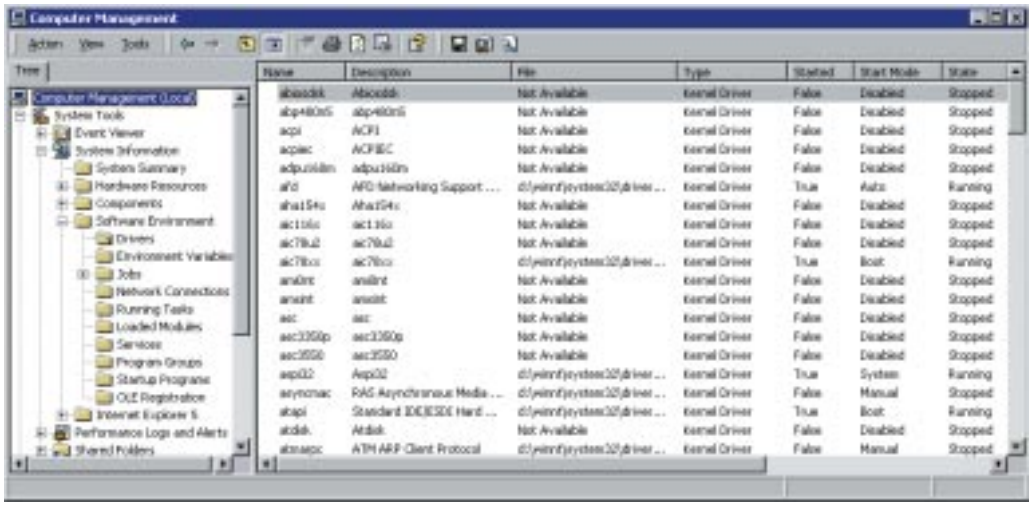


Not compatible with Windows 2000

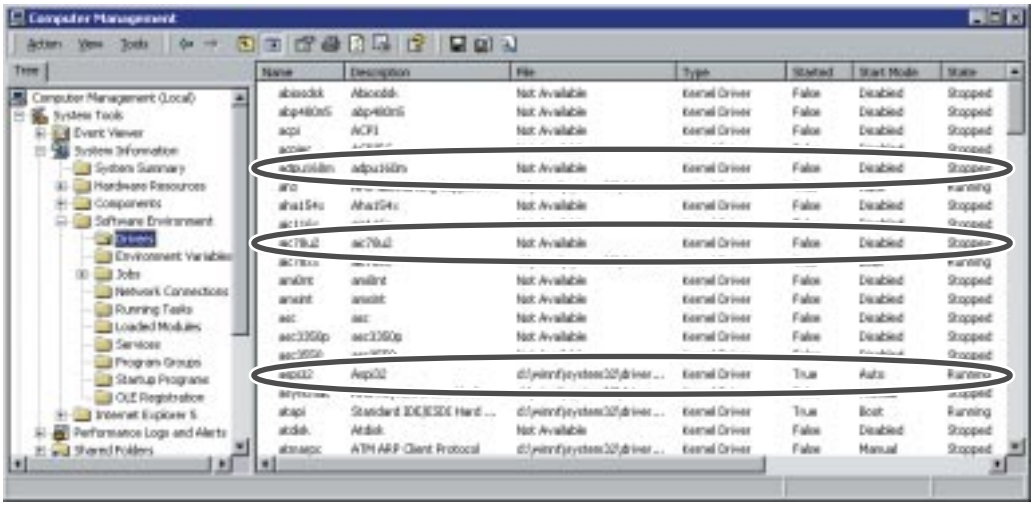


4.11 Checking Windows 2000 ASPI32 Status and Starting the Software

(1) Select “Start” → “Settings” → “Control Panel” → “Management Tools” → “Manage Computer”.



(2) Select “System Tools” → “System Info” → “Software Config.” → “Drivers”. Next, select “Display” → “Detailed Settings”.



Check that “Running” appears under “Status” for “aspi32.”
Check that “Running” appears under “Status” for “aic78xx.” (AHA-2910C,AHA-2940AU)
Check that “Running” appears under “Status” for “adf6u160.” (AVA-2915LP, AVA-2930LP)

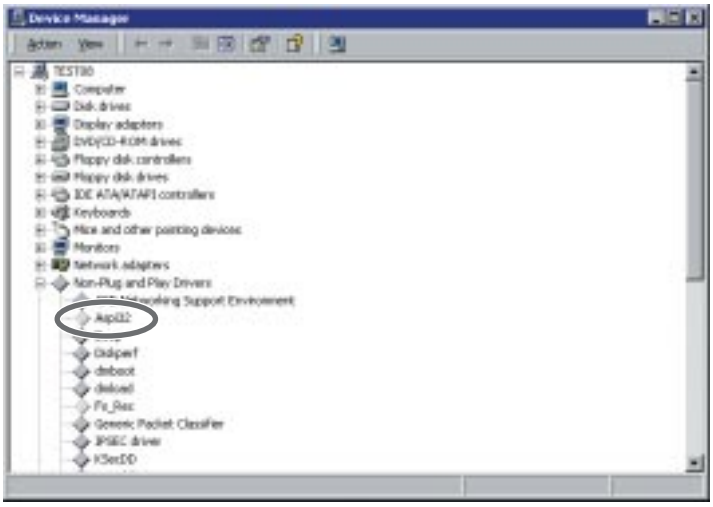
If “Running” does not appear (Windows 2000 ASPI32 is not running), follow the steps given below:

(1) Right-click the My Computer icon and select “Properties”.

(2) Click the “Device Manager” from the “Hardware” tab.

(3) Select “Display non-displayed devices” from the “View” menu.

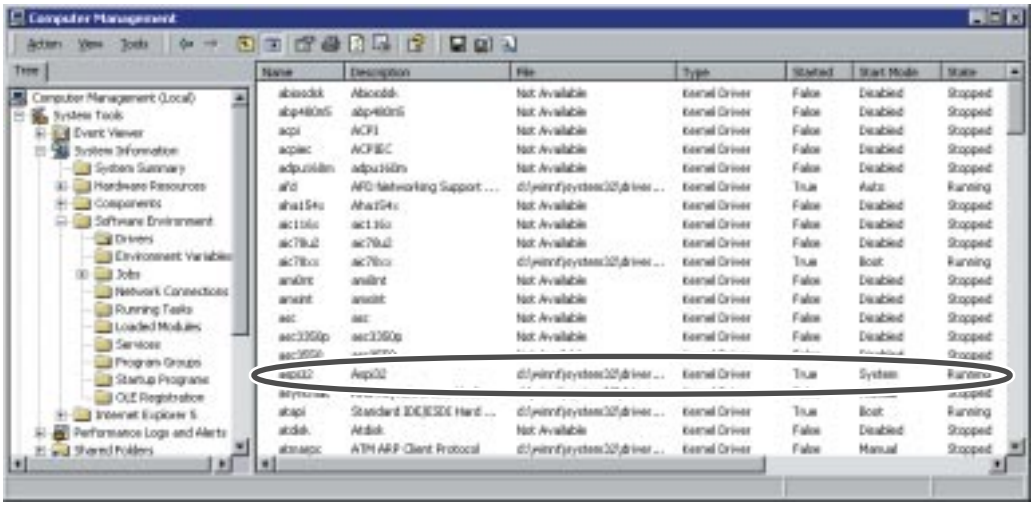
(4) Double-click “Non-Plug and Play Drivers”, then select and right-click “ASPI32.” Then, click “Properties”.



(5) Click the “Driver” tab. Check that “Started” appears as the current status. If “Started” does not appear, click the “Start” button.

(6) If “Automatic” is selected as Startup Type, click the down-arrow, select “System,” and click on the “OK” button to change the Startup Type to “System.”

(7) Check that “System” and “Running” respectively appear under “Start Mode” and “Status” for ASPI32.



4.12 Changing Transfer Rate with the AVA-2915LP (Ultra SCSI-compliant)

With the ADAPTEC AVA-2915LP UltraSCSI card, the transfer rate is set by default to 20 Mbps.
This may cause problems. For example, your PC may not detect the scanner when it is connected.
To avoid such problems, reduce the transfer rate to 10 Mbps.

Procedure

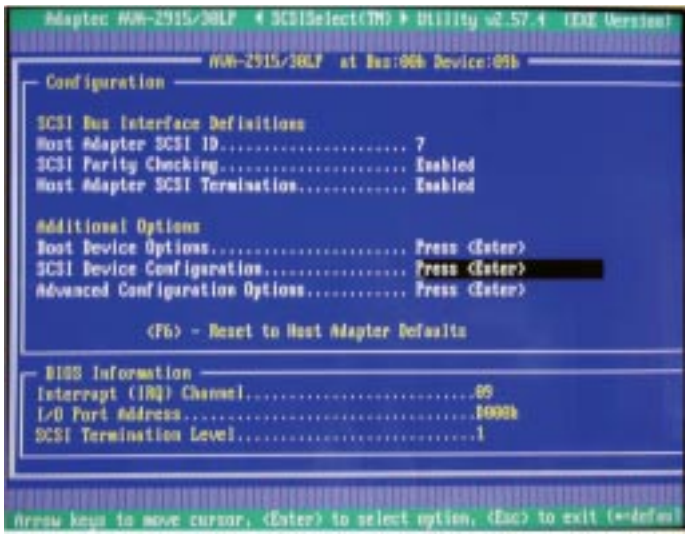
(1) Have the floppy disk supplied with the SCSI card ready.
Floppy disk name: Adaptec SCSI Select v2.57.4 For AVA-2915LP/2930LP To start SCSI Select

(2) Insert the floppy disk into the floppy disk drive and turn on your PC.

(3) When “AVA-2915/30LP at Bus; 00h Device; 09h” appears, select “Configure/View Host Adapter settings” and press the Enter key.

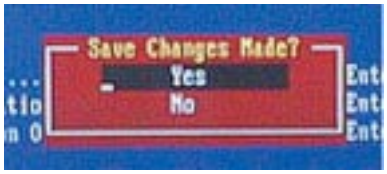
Would you like to configure the host adapter, or run the
SCSI Disk Utilities? Select the option and press <Enter>.
Press <F5> to switch between color and monochrome modes.
Options
Configure/View Host Adapter Settings
SCSI Disk Utilities

(4) Use the down-arrow key to select “SCSI Device Configuration.” Press the “Enter” key.

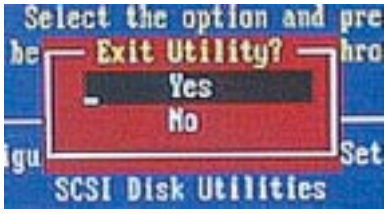


(5) Change “Maximum Sync Transfer Rate” for the corresponding SCSI ID.
If (for example) your scanner’s SCSI ID is 2, select “Sync Transfer Rate (MB/Sec)” for the SCSI Device ID #2 and press the “Enter” key. Then use the down-arrow key to select “10.0” and press the “Enter” key.

(6) Press the “Esc” key twice. When “Save Changes Made?” appears, select “Yes” and press the “Enter” key.



(7) Press the “Esc” key. When “Exit Utility?” appears, select “Yes” and press the “Enter” key.



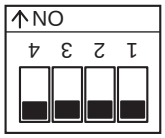
(8) When “Please press any key to reboot” appears, remove the floppy disk and press any key. At this time, your PC will restart.

CHECKPOINT

Checkpoint: If you have a FastSCSI card such as AHA-2910C or AHA-1520B, you do not need to change the transfer rate.

4.13 Factory Settings

DIP Switch



		DIP Switch's bits			
		4	3	2	1
Terminator	Disable	ON			
	Enable	OFF			
			Usually OFF		

All of 1 to 4 are OFF (Terminator is enabled).

ID Number

Set to No. 2

5. DAILY MAINTENANCE

5.1 Cleaning the Image Sensors

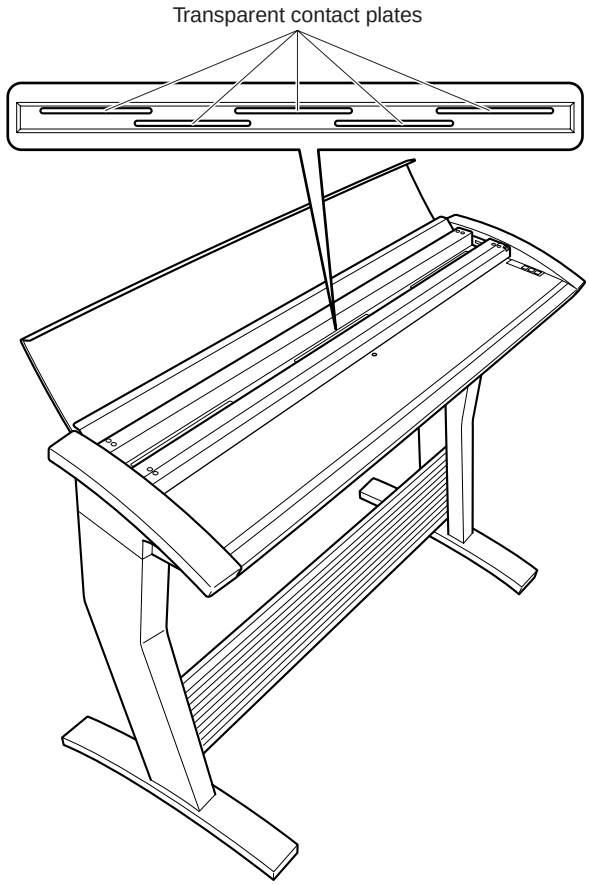
The scanner's image quality drops when the transparent contact plates over the image sensors become dirty, so clean the image sensors whenever necessary.

Procedure

(1) Turn off the scanner.

(2) Remove the document hold-down unit as described in Section 8.2 "Document Hold-Down Unit."

(3) As shown below, wipe off any soiled areas on the transparent contact plates using a soft cloth that has been moistened with water or a neutral detergent (diluted with water) and firmly wrung out.



(4) Completely remove any moisture on the transparent contact plates by wiping them off again using a soft, dry cloth.

(5) Mount the document hold-down unit as described in Section 8.2 "Document Hold-Down Unit."

CHECKPOINT

Do not use a commercial cleaner for office equipment, a glass cleaner, or chemical solvents such as solutions containing alcohol.

⚠CAUTION

Although the glass base unit is not a maintenance part that requires periodic replacement, it is a consumable part because its surface may receive slight scratches due to minute particles of dust and other foreign matter. If document scanning produces unsatisfactory results (unexpected white or black streaks in the data) due to scratches on the glass base unit or other reasons, the glass base unit will be replaced for no charge while the service warranty is in effect but will be replaced for a charge after the service warranty has expired. To request replacement, contact your nearest Graphtec vendor.

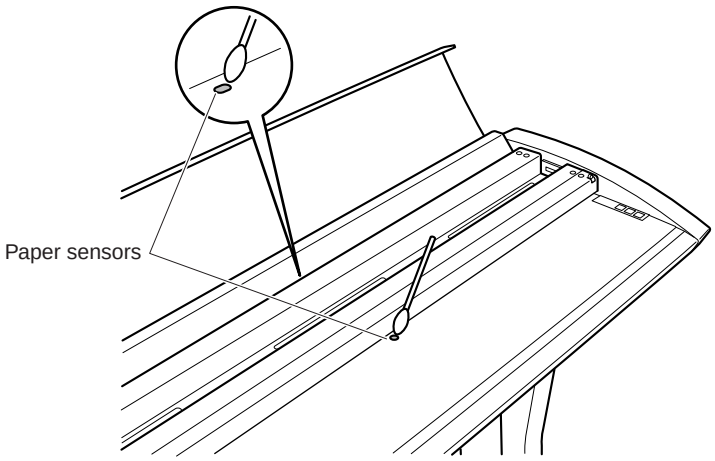
5.2 Cleaning the Paper Sensors

Accumulated dust on the paper sensors may prevent the document from being detected. The sensors must be cleaned when necessary.

(1) Turn off the scanner.

(2) Open the top cover, holding it in the center.

(3) Wipe the two paper sensors using a cotton swab.



(4) Close the top cover, holding it in the center.

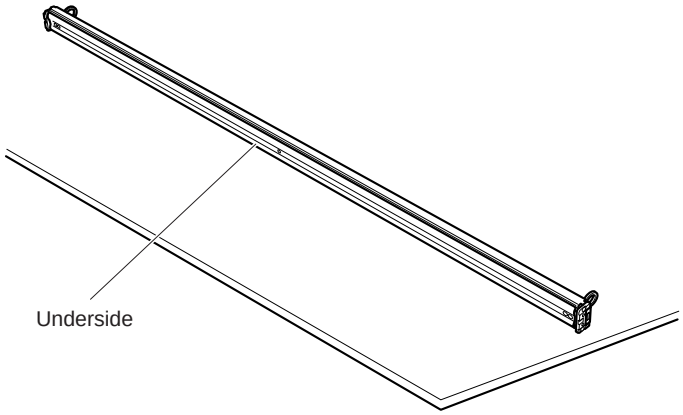
5.3 Cleaning the Document Hold-Down Unit

Scanning may be affected if the underside of the document hold-down unit becomes scratched or dirty. It must be cleaned when necessary.

(1) Turn off the scanner.

(2) Remove the document hold-down unit as described in Section 8.2 “Document Hold-Down Unit.”

(3) Wipe clean the underside of the document hold-down unit (see below) using a soft cloth that has been soaked in water or diluted neutral detergent and thoroughly wrung out.



(4) Wipe the document hold-down unit once again using a soft, dry cloth (remove all moisture).

(5) Reattach the document hold-down unit as described in Section 8.2 “Document Hold-Down Unit.”

5.4 Removing a Jammed Document

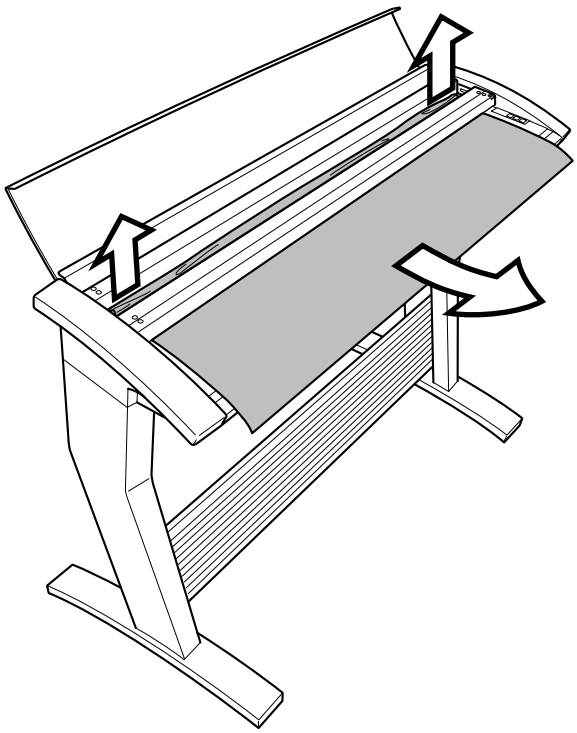
If a document becomes jammed in the scanner during scanning or another operation, immediately turn off the scanner, remove the document hold-down unit, and then remove the jammed document.

Procedure

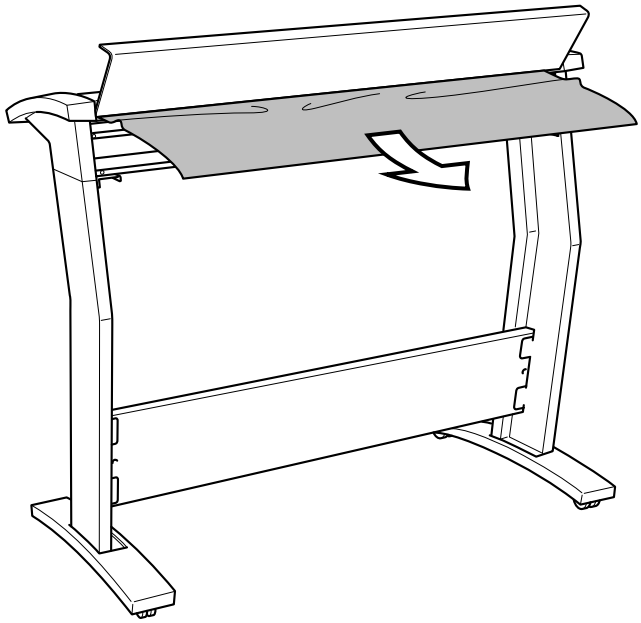
(1) Turn off the scanner.

(2) Remove the document hold-down unit as described in Section 8.2 “Document Hold-Down Unit.”

(3) If the document is jammed at the front, remove the document from the inside or by pulling it forward.



(4) If the document is jammed at the rear, remove the document from the inside by pulling it toward the rear.



(5) Reattach the document hold-down unit as described in Section 8.2 “Document Hold-Down Unit,” and close the top cover.

6. RECOMMENDED PARTS LIST

No	Parts No.	Description	Part name	Q'ty
1	378019021	Drive Belt Belt	60S2M380	1
2	500050305	ID Switch	ID Switch	1
3	500050731	Memory 64MB	D2V4A8D-CL2	1
4	500050736	24V Switching Power Supply	LDA75F-24-H	1
5	500050745	Motor	KT60LM06-551	1
6	500050747	Connection Cable (CIS Board to Main Board)	8925E050179030GG	2
7	500050803	3.3V Switching Power Supply	LDA15F-3-3.3	1
8	500050804	5V Switching Power Supply	LDA15F-5	1
9	500050807	Cooling Fan	TUDC24B4-500	1
10	502112009	Power Switch	SW, AJ7201B,	1
11	502210002	Paper Sensor	PS-R50L-A	1
12	640100533	A0 Carrier Sheet	IS10 Carrier Sheet	1
	641110720	A1 Carrier Sheet	CS1100 Carrier Sheet	1
13	641000221	Document Hold-down Unit CS1000	CS Retaining Plate	1
	641110200	Document Hold-down Unit CS1100	CS Retaining Plate	1
14	774012830	Document Hold-down Unit	Stanard CS1000EV	1
	774012840	Document Hold-down Unit EV	Hight Pressure CS1000EV	1
	774013830	Document Hold-down Unit	Stanard CS1100EV	1
	774013840	Document Hold-down Unit EV	Hight Pressure CS1100EV	1
15	641000240	Drive Roller CS1000/CS1000EV	CS Drive Roller	2
	641110240	Drive Roller CS1100EV	CS Drive Roller 1100EV	2
16	641000840	Operation Panel CS10	Operation Panel	1
17	774012500	Main Board Main Board	CS1000/CS1100EV	1
	774013500	Main Board Main Board	CS1100EV	1
18	774012510	CIS Control Board A	CIS Control Board A	1
19	774012520	CIS Control Board B	CIS Control Board B	1
20	774012800	Image Sensor Unit	(Maintenance)CS1000/1000EV	1
	774013800	Image Sensor Unit	(Maintenance)CS1100EV	1
21	774012810	Pinch Roller Unit	(Maintenance)CS1000/1000EV	2
	774013810	Pinch Roller Unit	(Maintenance)CS1100EV	2
22	774012820	Grass Base Unit CS1000/CS1000EV	(Maintenance)CS1000/1000EV	1
	774013820	Grass Base Unit CS1100EV	(Maintenance)CS1100EV	1
23	794021091	Operation Panel Board	IS21 Operation Panel Board	1
24	640007300	A1 Shading Sheet Assy	CS1100EV	1
	641000560	A0 Shading Sheet Assy	CS1000EV	1
25	641110740	A1 Shading Sheet	CS1100EV	1
	641000590	A0 Shading Sheet	CS1000EV	1

7. LIST OF JIGS AND TOOLS

7.1 Jigs

Jigs	Adjustments	Remarks
IS3100 ROM jig	•Downloading boot program	CS1000/EPROM
CS1000 system floppy disk	•Downloading system program	CS1000.X
Spacer (BSB-335)	•Attaching main board to bottom plate, large	Hexagonal, 35 mm in length
OPS112 (Scanning Master 21+)	•Adjusting feed distance •Adjusting offset •Aligning sensor images •Shading (undesired color line removal) •Shading (undesired gray line removal) •Used to check resolution •Checking sensor color density	Software supplied with the scanner
Shading paper	•Shading •Replacing main board	IJ-RC-GN (Mitsubishi Paper Mills) 1050 mm x 200 mm
CS1000 adjustment test chart	•Adjusting feed distance •Adjusting offset •Aligning sensor images	Record measured values between a and c, b and d, a and b, c and d, a and d, and b and c.
Undesired color line removal check paper	•Shading (undesired color line removal)	For checking undesired color or white lines
Fax test chart No. 3	•Shading (undesired gray line removal)	For checking undesired gray or black lines
MTF adjustment test chart	•Resolution checking	6-line-pair resolution pattern
Color difference measurement sample.xls	•Checking sensor color density	Excel file
Color test chart	•Checking sensor color density	Red, green, blue, black, white pattern To be stored in a darkroom

7.2 Tools

Jigs	Adjustments	Remarks
Screwdriver Allen wrench Needle-nose pliers	Disassembly, reassembly, and other operations	Large, medium, and small flatblade screwdrivers and Phillips screwdrivers
Colex gauge	Adjusting belt tension	200 g/4 mm displacement
Multimeter	Checking voltage level	

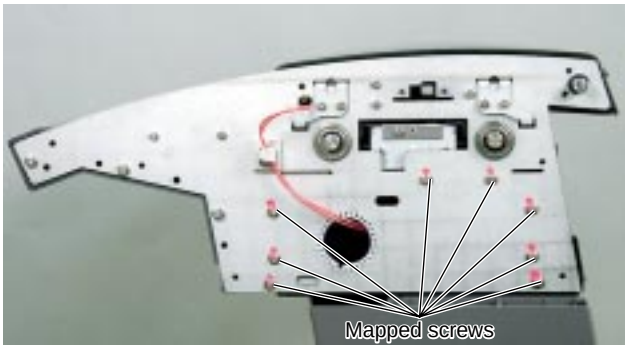
7.3 Other

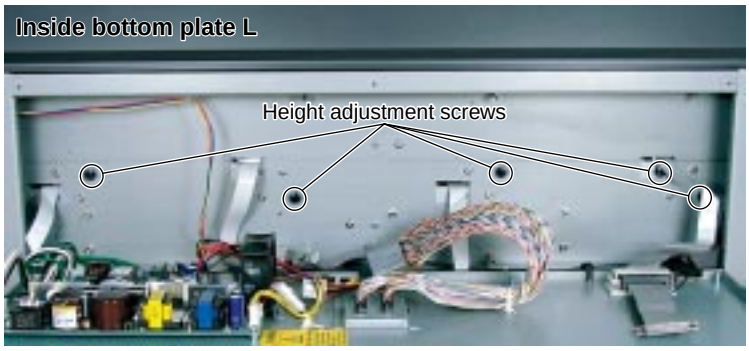
Other	Adjustments	Remarks
Water-diluted neutral detergent or absolute ethanol wiper (cloth)	Cleaning	
PC SCSI card SCSI cable	Used to determine whether the problem is caused by the scanner or any other equipment.	

8. DISASSEMBLING AND ADJUSTING MECHANICAL PARTS

8.1 Considerations before starting disassembly

- To prevent damage to image sensors, remove the document hold-down unit before disassembling any mechanical parts.
- Removing screws and any parts other than those shown in this chapter may adversely affect scanner performance, including degraded scanning accuracy.
  In particular, never attempt to remove or turn the red shielded screws and height adjustment screws.





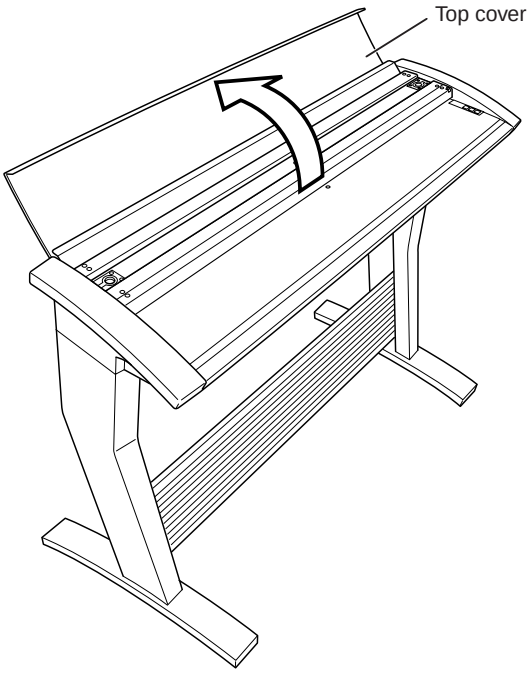
- The directions "left" and "right" given in this chapter assume that the scanner unit is viewed from the front.

8.2 Document Hold-down Unit

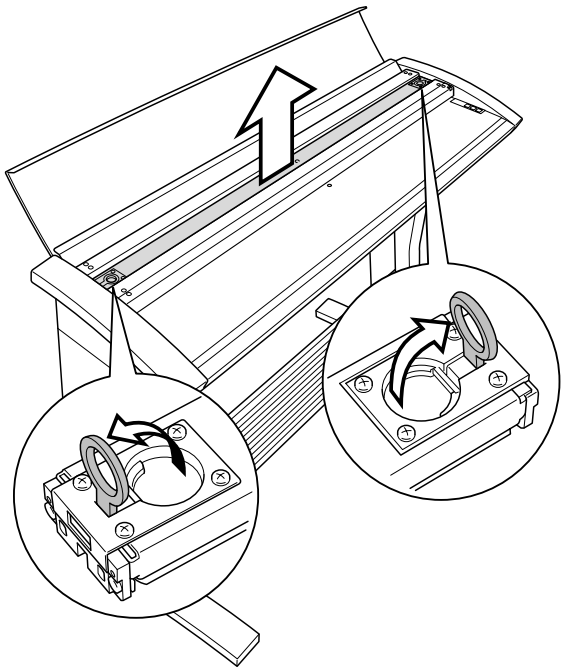
Detaching the document hold-down unit

(1) Turn off the scanner.

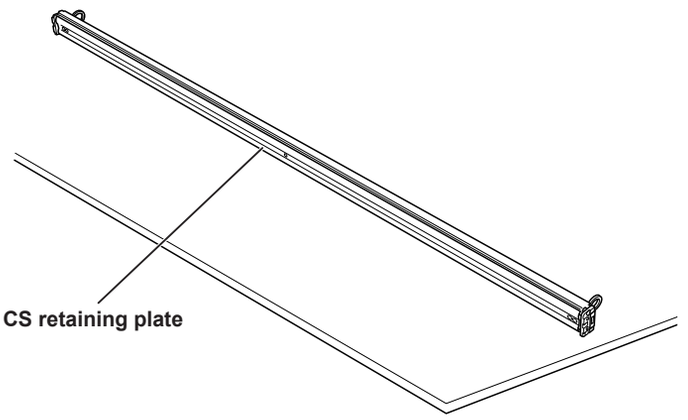
(2) Open the top cover, grasping it at the center.



(3) Set the handle-ring at each end of the document hold-down unit upright, hold these handle-rings with your hands, and raise the unit from the scanner unit.



(4) Once the document hold-down unit has been removed, set the CS retaining plate (white section) on its side on a stable surface.



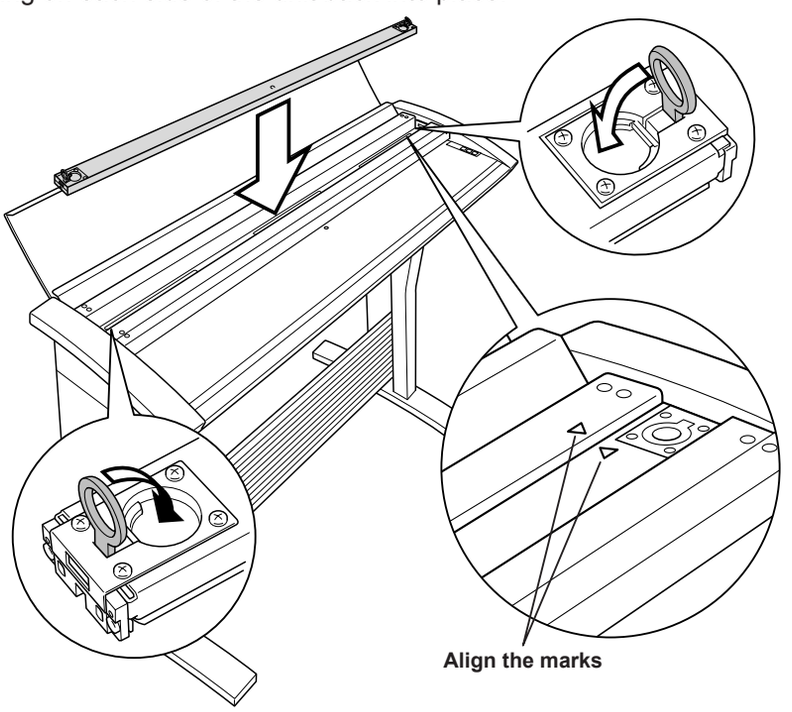
⚠CAUTION

Scanning may be affected if the underside of the document hold-down unit becomes scratched or dirty.

Reattaching the document hold-down unit

(1) Check the orientation stickers on the scanner unit and the document hold-down unit. Hold the handle-ring on each side of the unit and lower the unit to fit it into the scanner unit.

(2) Fold the handle-ring on each side of the unit back into place.



(3) Close the top cover, grasping it at the center.

⚠CAUTION

The clearance between the document hold-down unit and the separator plates has been factory-adjusted for accuracy. Attaching the unit in the wrong way will significantly affect scanning accuracy. Be sure to check the orientation stickers (marked with △) on the scanner unit and the document hold-down unit before attaching the unit. (See the figure above) Insert the document hold-down unit all the way to the bottom. If the unit is not pressed down, image quality will be degraded and paper jams more likely to occur.

8.3 CS Retaining Plate

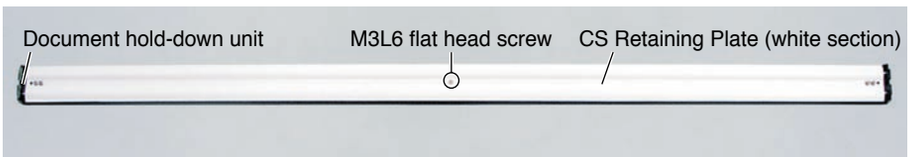
Disassembly procedure

8.2 p.8-2		This Section
Detaching the document hold-down unit	➡	Detaching the CS retaining plate

Detaching the CS Retaining Plate

(1) Check the orientation (left- and right-hand sides) of the CS retaining plate (white section).

(2) With the CS retaining plate facing up, remove the silver M3L6 flat head screw.



(3) Pull out each of the right- and left-hand undersides one at a time, then detach the CS retaining plate.

⚠CAUTION

When detaching the undersides, note that the spring inside may fly out. Take appropriate measures to avoid losing the spring.

Reattaching the CS Retaining Plate

(1) Reattach the CS retaining plate with the same direction as before its removal. (You do not need to check for orientation when replacing with a new CS retaining plate.)

⚠CAUTION

The clearance between the document hold-down unit and the separator plates has been factory-adjusted for accuracy. Attaching the unit's underside in the wrong direction can significantly affect scanning accuracy. Be sure to reattach it with the same direction as before its removal. You need to adjust the clearance between the document hold-down unit and the separator plates when you are going to install new document hold-down unit (see subsection 8.13 "Reattaching the separator plates").

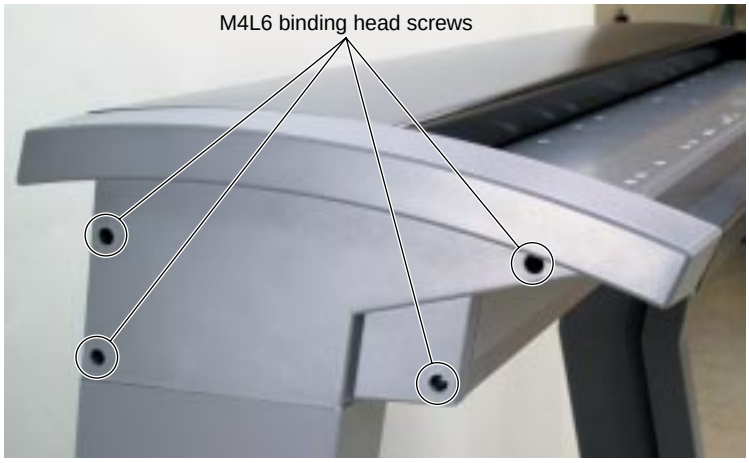
8.4 Side Covers

Disassembly procedure

8.2 p.8-2	→	This Section
Detaching the document hold-down unit		Detaching the side covers

Detaching the side covers

(1) Remove the four black M4L6 binding head screws on each side of the scanner unit. (Both sides)

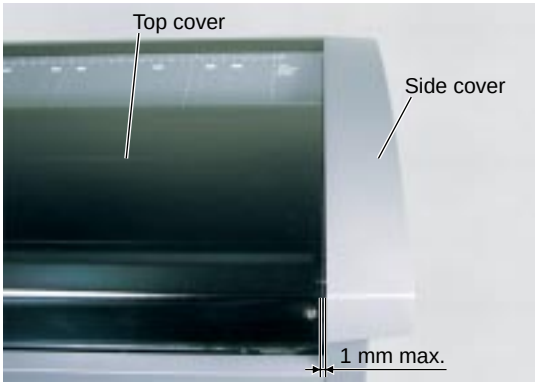


(2) Detach the side covers.

Reattaching the side covers

(1) Reattach the side covers in the reverse order in which they were detached.

(2) Make sure the clearance between the top cover and each of the side covers is 1 mm or less.



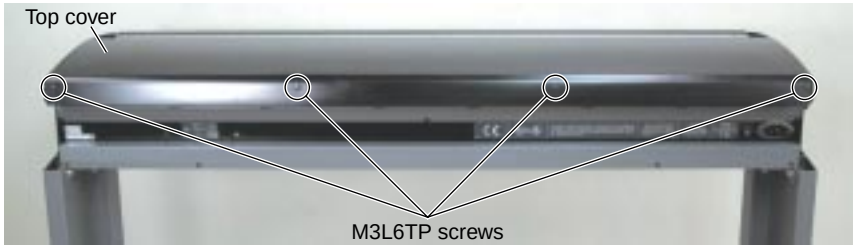
8.5 Top Cover

Disassembly procedure

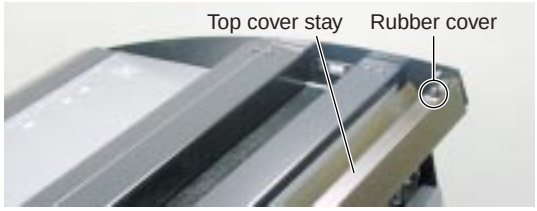
8.2 p.8-2	→	8.4 p.8-5	→	This Section
Detaching the document hold-down unit		Detaching the side covers		Detaching the top cover

Detaching the top cover

(1) Remove the four black M3L6TP screws in the back of the top cover and detach the upper section of the cover.



(2) Detach the rubber cover from the M4L8 binding head screw.



(3) Detach the E-ring from the right-hand surface and two silver M4L8 binding head screws from the left-hand surface.

(4) Pull out the top cover stay.

Reattaching the top cover

(1) Reattach the top cover in the reverse order in which it was detached.
(2) Make sure the clearance between the top cover and each of the side covers is 1 mm or less. (See the previous page.)

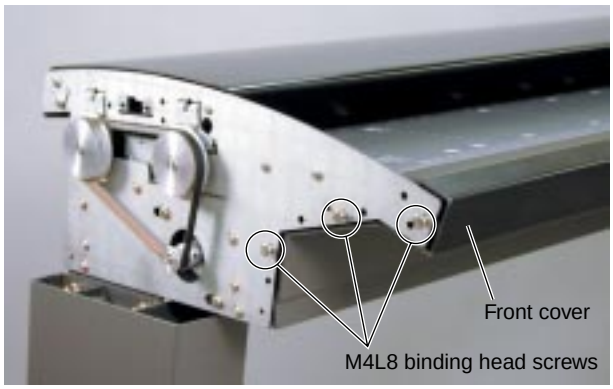
8.6 Front Cover

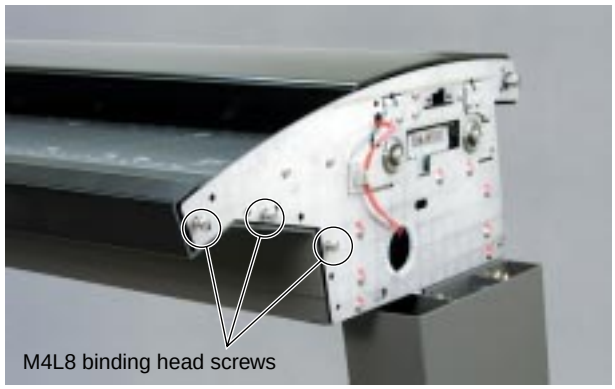
Disassembly procedure

8.2 p.8-2	→	8.4 p.8-5	→	This Section
Detaching the document hold-down unit		Detaching the side covers		Detaching the front cover

Detaching the front cover

(1) Remove the three silver M4L6 binding head screws holding the front cover from each side.





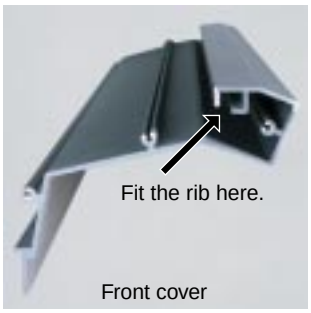
(2) Pull the front cover toward you to detach it.

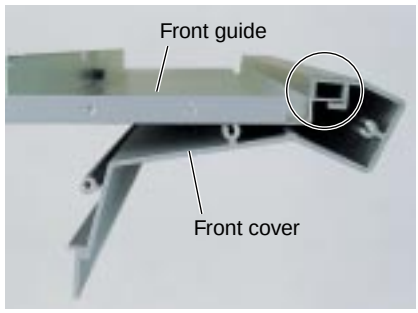
Reattaching the front cover

(1) Reattach the front cover in the reverse order in which it was detached.

⚠CAUTION

When reattaching the front cover, be sure to fit the front guide rib into a section of the front cover, as shown below.





8.7 Rear Cover

Disassembly procedure

8.2 p.8-2	→	This Section
Detaching the document hold-down unit		Detaching the rear cover

Detaching the rear cover

(1) Remove the four black M3L6 binding head screws in the back of the scanner unit.

(2) Detach the rear cover.

Reattaching the rear cover

(1) Reattach the rear cover in the reverse order in which it was detached.

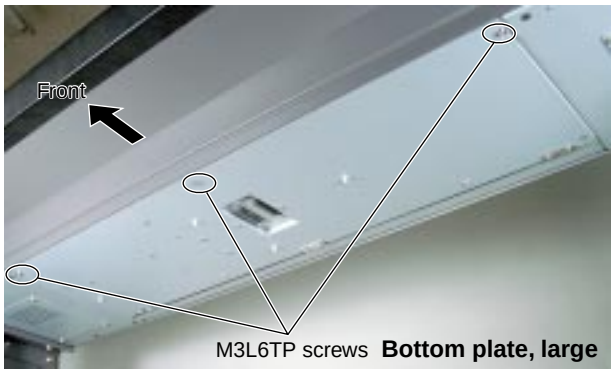
8.8 Bottom Plates, Large and Small

Disassembly procedure

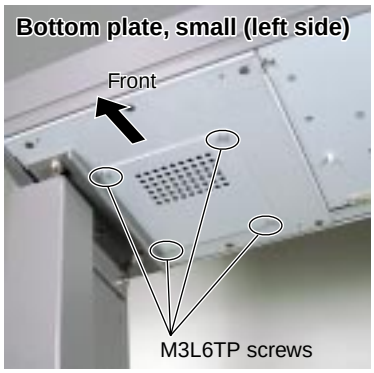
8.2 p.8-2	This Section
Detaching the document hold-down unit	Detaching the bottom plates, large and small

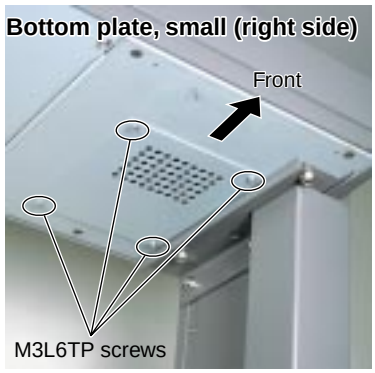
Detaching the bottom plates, large and small

(1) Remove the three silver M3L6TP screws while supporting the large bottom plate with one hand.



(2) Remove the four silver M3L6TP screws while supporting the small bottom plates (left and right sides) with one hand.





⚠CAUTION

Support the bottom plates to keep them from dropping when the screws are removed.

Reattaching the bottom plates

(1) Reattach the bottom plates in the reverse order in which they were detached.

(2) Make sure the ventilating openings face forward when reattaching the bottom plates.

⚠CAUTION

The attachment direction of the small bottom plates is specified by UL standard. Special care must be taken to attach the panel correctly.

8.9 Main Board

Disassembly procedure

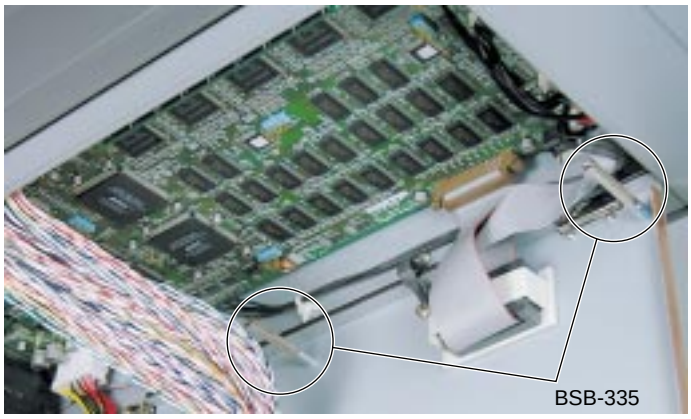
8.2 p.8-2 Detaching the document hold-down unit → 8.8 p.8-9 Detaching the large bottom plate → This Section: Detaching the main board

CS1000/1000EV disassembly procedure

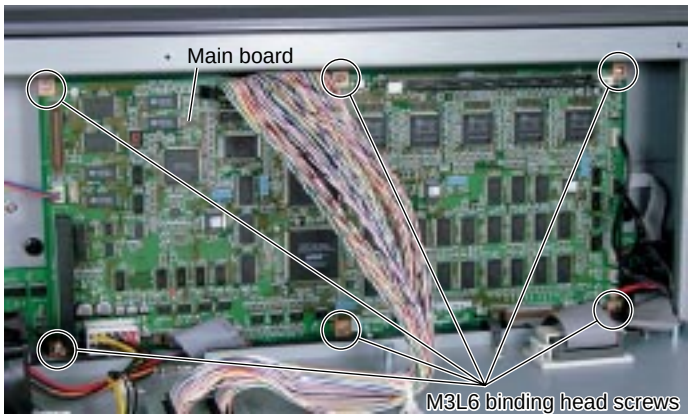
When securing the main board to the jig (BSB-335)

Detaching the main board

(1) Attach the jig (BSB-335) to the inside of the large bottom plate.



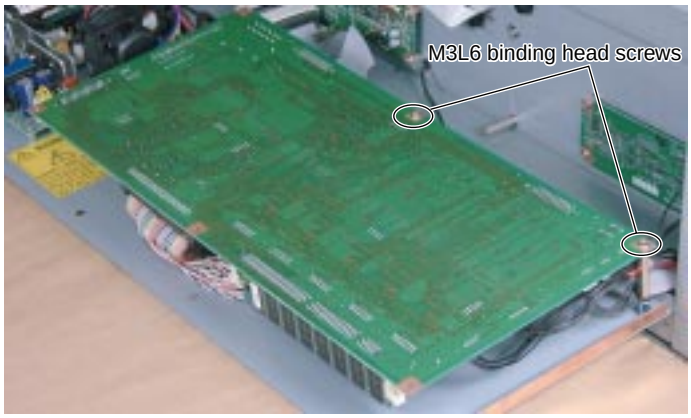
(2) Remove the six silver M3L6 binding head screws while supporting the main board with one hand.



⚠CAUTION

To prevent the main board from falling and damaging its connectors and wiring when the screws are removed, be sure to support the board.

(3) Use the two silver M3L6 binding head screws, that were used to hold the main board, to secure the board to the jig (BSB-335).



⚠CAUTION

When attaching the main board to the jig (BSB-335), remove tie wraps and other restraints as necessary to prevent wiring and connectors from becoming strained.

Reattaching the main board

(1) Reattach the main board in the reverse order in which it was detached.

When detaching the main board completely (not for securing it to the jig)

Detaching the main board

(1) Remove all connectors and the six silver M3L6 binding head screws while supporting the board. (See the previous page.)

⚠CAUTION

To prevent the main board from falling and damaging its connectors and wiring when the screws are removed, be sure to support the board.

(2) Place the main board on a safe and stable surface.

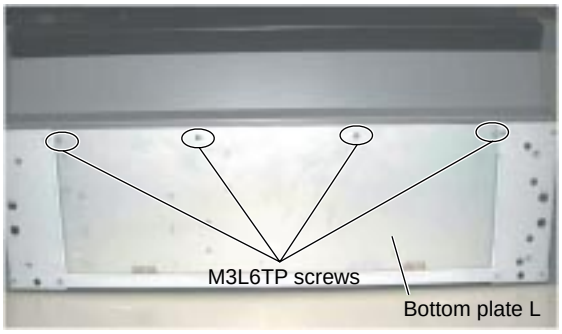
Reattaching the main board

(1) Reattach the board in the reverse order in which it was detached.

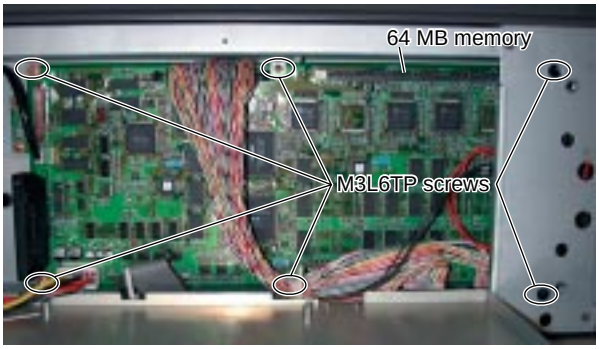
CS1100EV disassembly procedure

(1) Detach the foot stays from the main unit if fitted. Likewise detach the scanner from the stand if mounted. Place the scanner on a level work surface with the rear side facing downward.

(2) Remove the four M3L6TP screws (silver) while supporting the bottom plate L.



(3) Remove the six M3L6 binding head screws (silver) securing the main board.



(4) Slide the main board slightly to the left and detach the cables.

(5) Detach the 64 MB memory from the P4 connector.

Installing

(1) Repeat the procedure above in reverse.

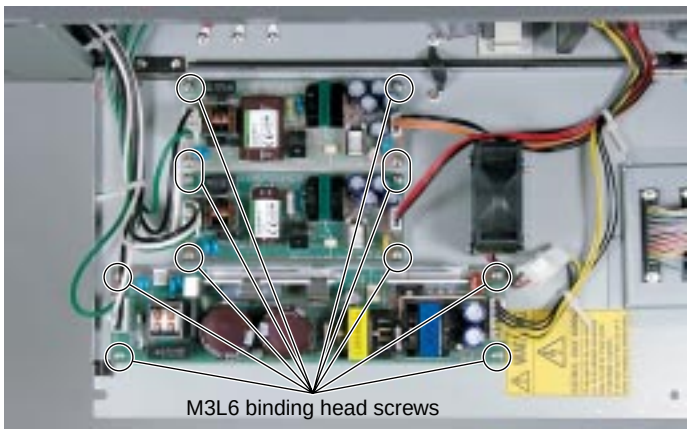
8.10 Power Boards

Disassembly procedure

8.2 p.8-2	→	8.8 p.8-9	→	This Section
Detaching the document hold-down unit		Detaching the large bottom plate		Detaching the power boards

Detaching the power boards

(1) Remove all connectors and the four silver M3L6 binding head screws from each of the power boards, while supporting the board with one hand.



⚠CAUTION

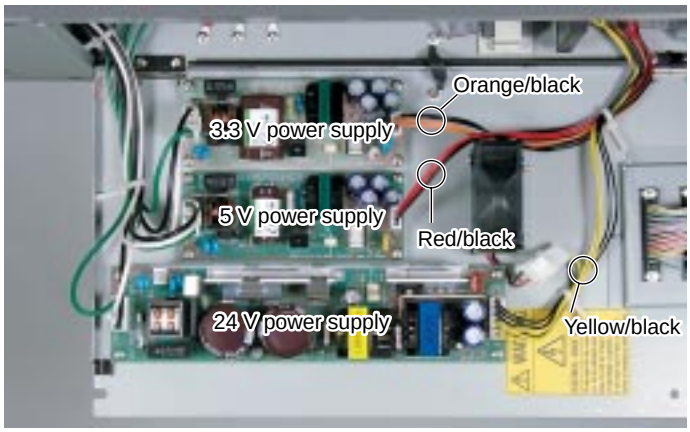
To prevent the power boards from falling and becoming damaged when the screws are removed, be sure to support each of the boards.

(2) Place each of the boards on a safe and stable surface.

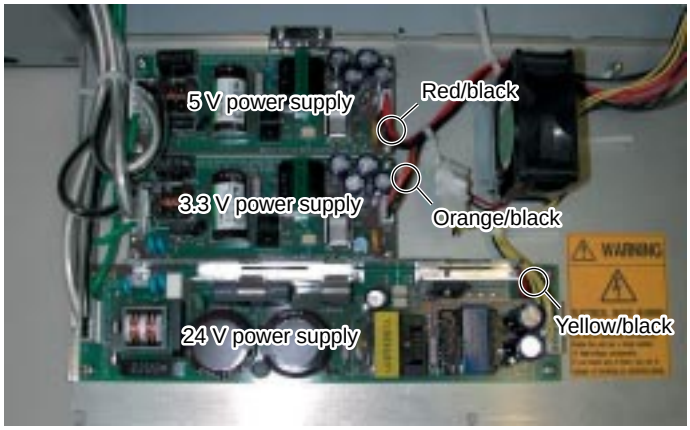
Reattaching the power boards (CS1000)

(1) Reattach the boards in the reverse order in which they were detached.

(2) Be sure to attach each board at the appropriate location and to the appropriate connectors. When attaching the connectors, check the cable colors as shown below.



Reattaching the power boards (CS1000EV/1100EV)



⚠CAUTION

The power unit installation positions differ from the CS1000.
Take care to install and wire correctly.
CS1000: In sequence 3.3 V, 5 V, 24 V from top
CS1000EV (B0 size or larger): In sequence 5 V, 3.3 V, 24 V from top
CS1100EV (A0 size or larger): In sequence 5 V, 3.3 V, 24 V from top
TM9000 (A0 size or larger): In sequence 3.3 V, 5 V, 24 V from top
TM9000 (B0 size or larger): In sequence 5 V, 3.3 V, 24 V from top

8.11 CIS (Charge Coupled Device Imaging Sensor) Boards A and B

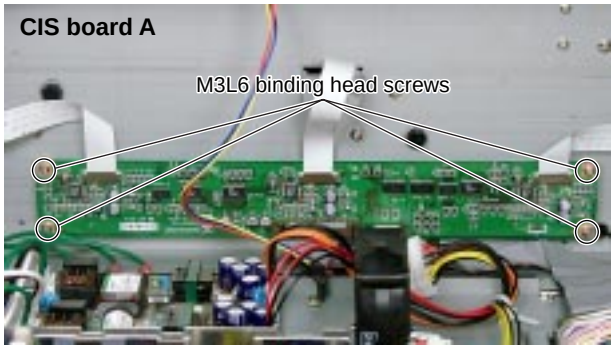
Disassembly procedure

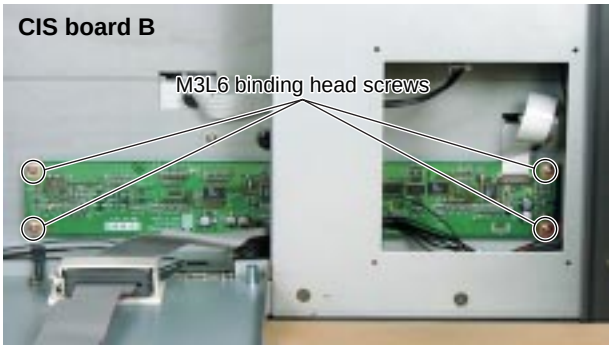
8.2 p.8-2 Detaching the document hold-down unit → 8.8 p.8-9 Detaching bottom plates, large and small (detach the right-hand small plate only) → 8.9 p.8-11 Detaching the main board completely (not for securing it to the jig) → This Section: Detaching the CIS boards

CS1000/1000EV disassembly procedure

Detaching the CIS boards

(1) Remove all connectors and the four silver M3L6 binding head screws from each of the CIS boards while supporting the board with one hand.





⚠CAUTION

To prevent the CIS boards from falling and becoming damaged when the screws are removed, be sure to support each of the boards.

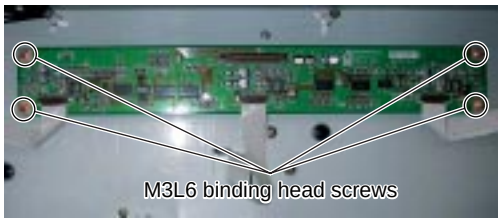
(2) Place the CIS boards on a safe and stable surface.

Reattaching the CIS boards

(1) Reattach the CIS boards in the reverse order in which they were detached.

CS1100EV disassembly procedure

(1) Detach the connectors and remove the four M3L6 binding head screws (silver) while supporting the CIS board.



Installing

(1) Repeat the procedure in reverse.

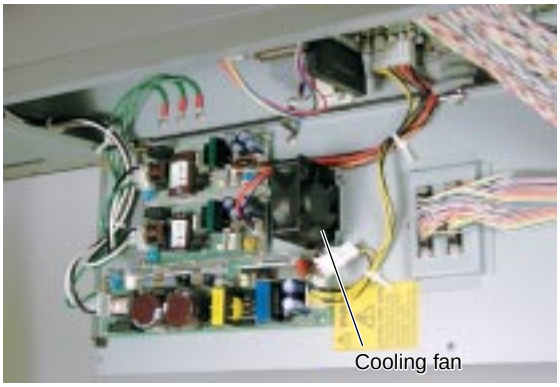
8.12 Cooling Fan

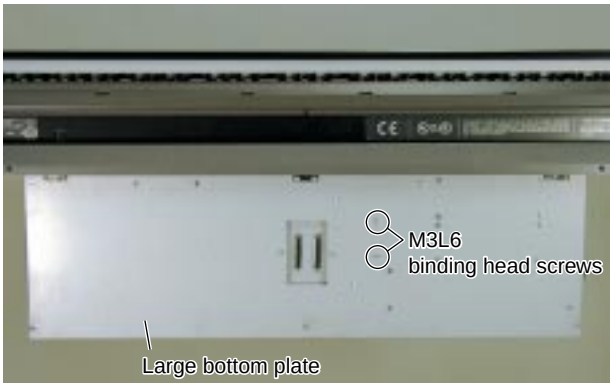
Disassembly procedure

8.2 p.8-2	→	8.8 p.8-9	→	This Section
Detaching the document hold-down unit		Detaching the large bottom plate		Detaching the cooling fan

Detaching the cooling fan

(1) Remove all connectors and the two silver M3L6 binding head screws secured to the large bottom plate.





⚠CAUTION

Hold the cooling fan to keep it from falling and damaging the connectors and wiring when the screws are removed.

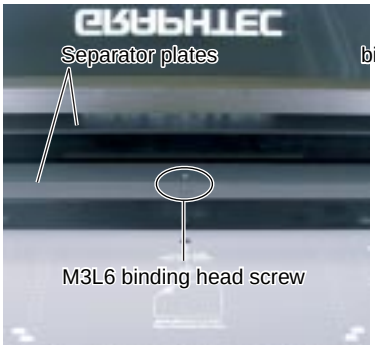
8.13 Separator Plates

Disassembly procedure

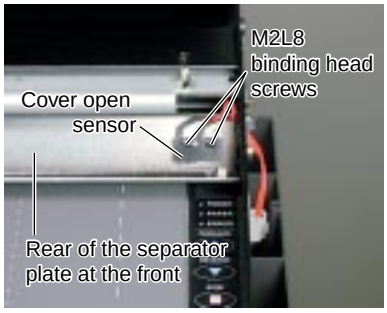
8.2 p.8-2	→	8.4 p.8-5	→	This Section
Detaching the document hold-down unit		Detaching the side covers		Detaching the separator plates

Detaching the separator plates

(1) Remove the ten black M3L6 binding head screws and three silver binding head screws.



(2) Detach the cover open sensor from the separator plate at the front by removing the two black M2L8 binding head screws.

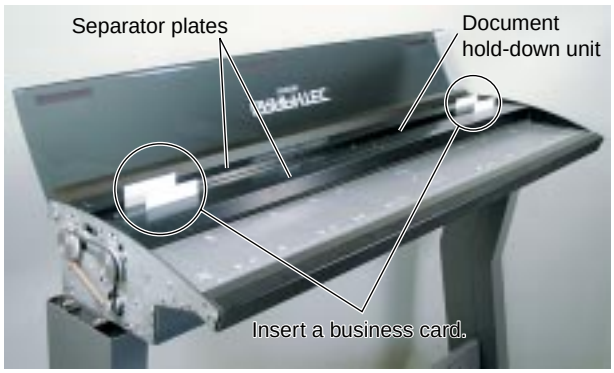


(3) Detach the separator plates.

Reattaching the separator plates

(1) Reattach the separator plates in the reverse order in which they were detached.

(2) Insert a business card or something similar between the separator plates and the document hold-down unit to maintain appropriate clearance between them. This will make it easier to detach and reattach the document hold-down unit.



8.14 Pinch Roller Units

Disassembly procedure

8.2 p.8-2 Detaching the document hold-down unit → 8.4 p.8-5 Detaching the side covers → 8.13 p.8-15 Detaching the separator plates → This Section Detaching the pinch roller units

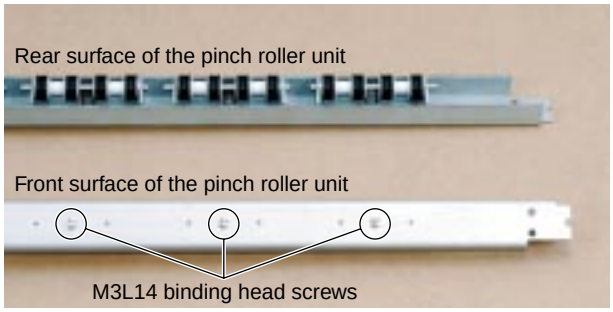
Detaching the pinch roller units

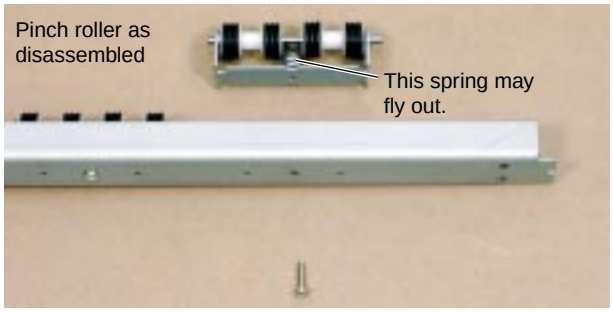
(1) Remove the two spacers (BSB305) from each side of the pinch roller units.
(You can detach the pinch roller units without removing the spacers (BSB305) in the center of the units.)

(2) Detach the pinch roller units.

Disassembling the pinch roller units

(1) Remove the three silver M3L14 binding head screws to disassemble each pinch roller unit.
Take care to keep the spring inside from flying out and becoming lost.



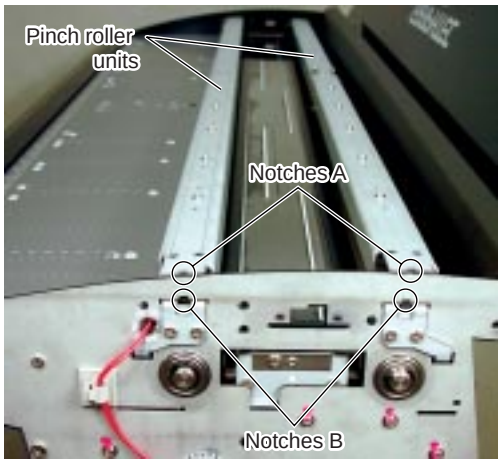


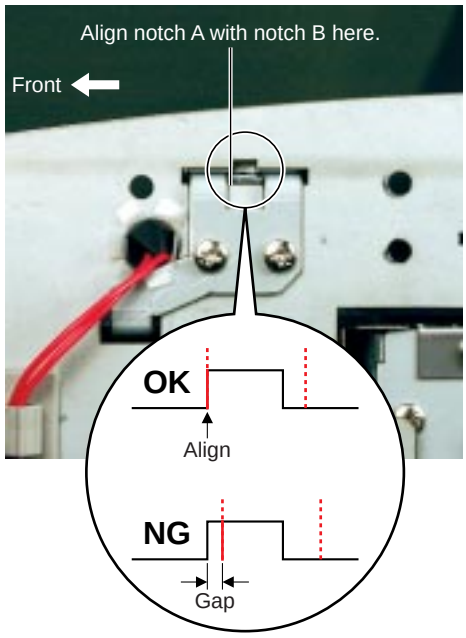
Reattaching the pinch roller units

(1) Reattach the pinch roller units in the reverse order in which they were detached.

(2) Make sure the large notch of each unit is at the right-hand side and faces forward.

(3) Align notch A of each pinch roller unit with the front section of notch B of the scanner unit when reattaching the unit.



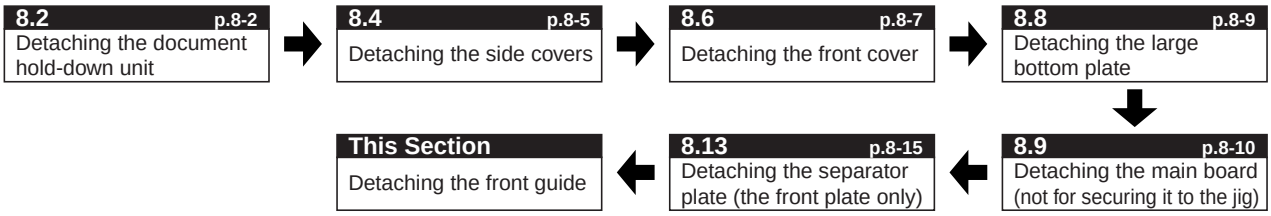


⚠CAUTION

The paper feed and scanning accuracy may be affected if the notches are not aligned. Step (3) in “Reattaching the pinch roller units” above must be followed.

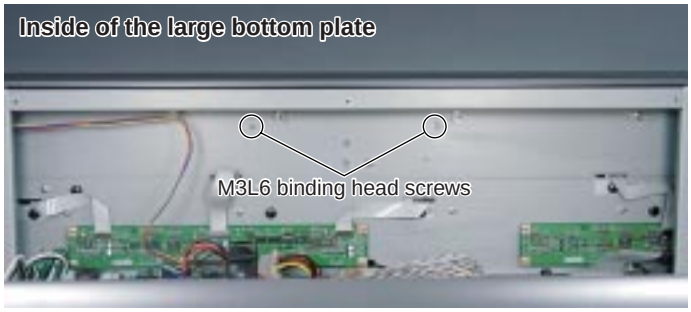
8.15 Front Guide

Disassembly procedure



Detaching the front guide

(1) Remove the two black M3L6 binding head screws and four silver M3L6 binding head screws.



(2) Pull out the front guide.

Reattaching the front guide

(1) Make the necessary adjustments to make sure that the guide does not touch the drive roller and that no gaps are wide enough for a document to slip into them. When you finish, tighten the M3L6 binding head screws on the left-hand side.

(2) Tighten the other screws to reattach the front guide in the reverse order in which it was detached.

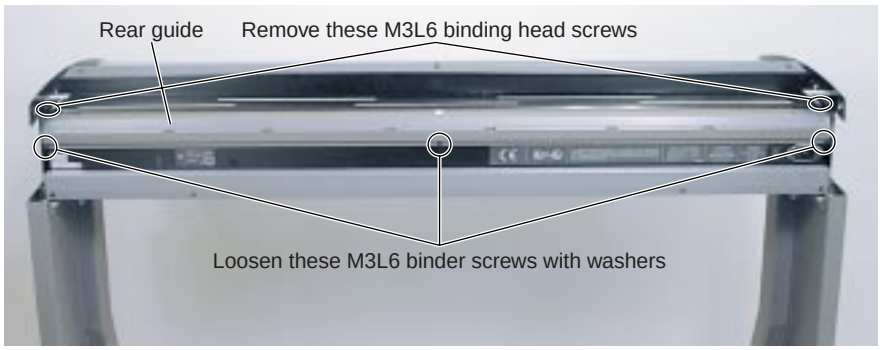
8.16 Rear Guide

Disassembly procedure

8.2 p.8-2	8.4 p.8-5	8.5 p.8-6	This Section
Detaching the document hold-down unit	Detaching the side covers	Detaching the top cover	Detaching the rear guide

Detaching the rear guide

(1) Loosen the three black M3L6 binding head screws in the back of the scanner unit and remove the two black M3L6 binding head screws on top of the scanner unit.



(2) Slide the rear guide upward to detach it.

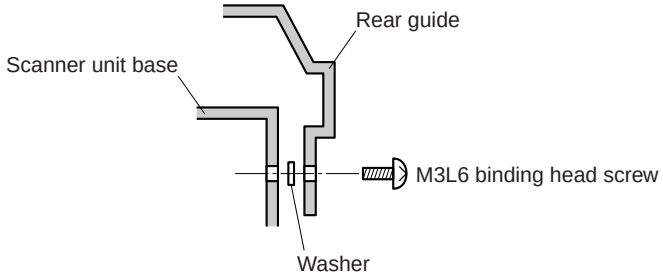
Reattaching the rear guide

(1) Reattach the rear guide in the reverse order in which it was detached.

(2) Make the necessary adjustments to make sure that the guide does not touch the drive roller and that no gaps are wide enough for a document to slip into them.

⚠CAUTION

When attaching the rear guide, insert a washer between the rear guide and the scanner unit base.



8.17 Control Panel

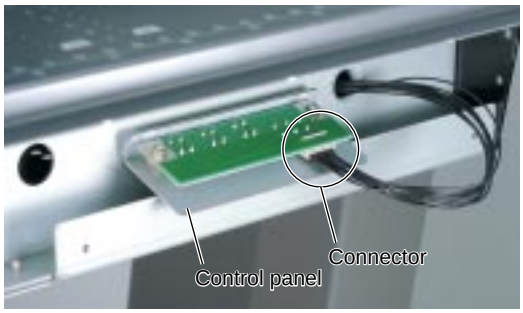
Disassembly procedure

8.2 p.8-2	8.4 p.8-5	8.6 p.8-7	This Section
Detaching the document hold-down unit	Detaching the side covers	Detaching the front cover	Detaching the control panel

Detaching the control panel

(1) Remove the two silver M3L6 binding head screws.

(2) Detach the connector from the control panel.

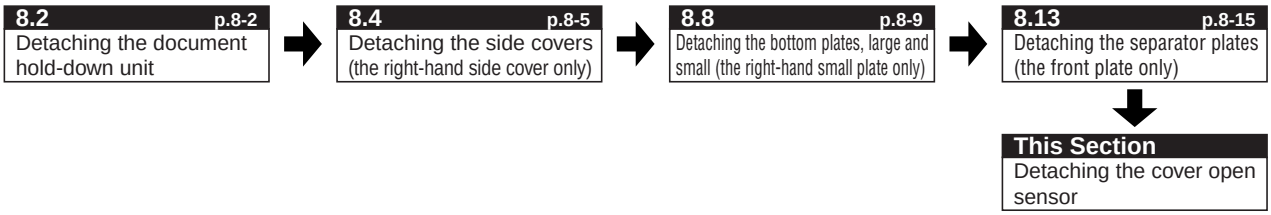


Reattaching the control panel

(1) Reattach the control panel by reversing the sequence of steps in which it was detached.

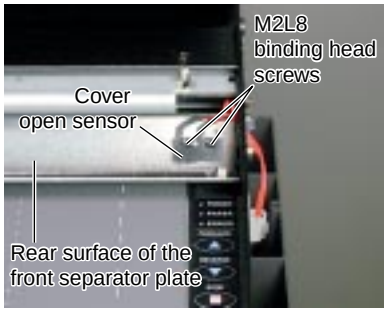
8.18 Cover Open Sensor

Disassembly procedure


8.2 p.8-2
Detaching the document hold-down unit
8.4 p.8-5
Detaching the side covers (the right-hand side cover only)
8.8 p.8-9
Detaching the bottom plates, large and small (the right-hand small plate only)
8.13 p.8-15
Detaching the separator plates (the front plate only)
This Section
Detaching the cover open sensor

Detaching the cover open sensor

(1) Remove the two black M2L8 binding head screws from the rear surface of the front separator plate.



(2) Detach the main board connectors from the cables.

(3) Disconnect the cables and detach the cover open sensor.

Reattaching the cover open sensor

(1) Reattach the cover open sensor by reversing the sequence of steps in which it was detached.

⚠CAUTION

For optimal sensitivity, attach the sensor as far up as possible.

8.19 Front and Rear Paper Detection Sensors

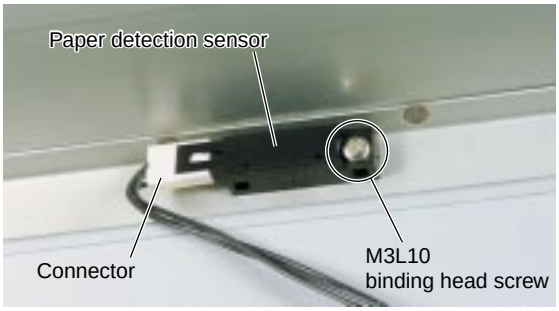
Disassembly procedure (front sensor)

8.2 p.8-2	→	8.4 p.8-5	→	8.6 p.8-7	→	This Section
Detaching the document hold-down unit		Detaching the side covers		Detaching the front cover		Detaching the front paper detection sensor

Detaching the front paper detection sensor

(1) Remove the silver M3L10 binding head screw below the front guide.

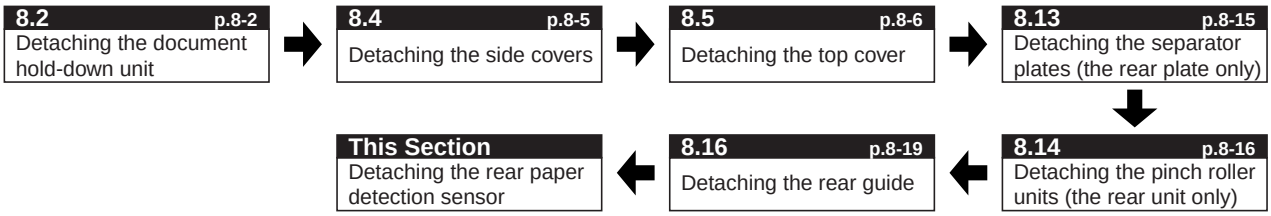
(2) Detach the connector from the paper detection sensor.



Reattaching the front paper detection sensor

(1) Reattach the paper detection sensor by reversing the sequence of steps in which it was detached.

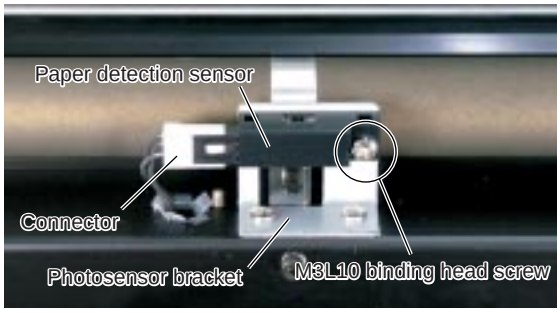
Disassembly procedure (rear sensor)



Detaching the rear paper detection sensor

(1) Remove the silver M3L10 binding head screw from the photosensor bracket that is attached to the upper section of the rear cover.

(2) Detach the connector from the paper detection sensor.



Reattaching the rear paper detection sensor

(1) Reattach the paper detection sensor by reversing the sequence of steps in which it was detached.

8.20 Motor

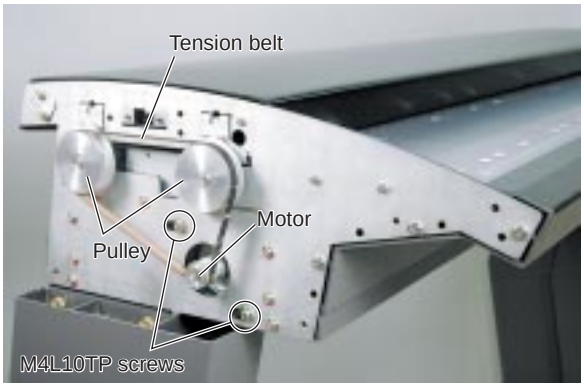
Disassembly procedure

8.2 p.8-2 Detaching the document hold-down unit → 8.4 p.8-5 Detaching the side covers → 8.8 p.8-9 Detaching the bottom plate, large and small (the left-hand small plate only) → This Section Detaching the motor

Detaching the motor

(1) Remove the two silver M4L10TP screws.

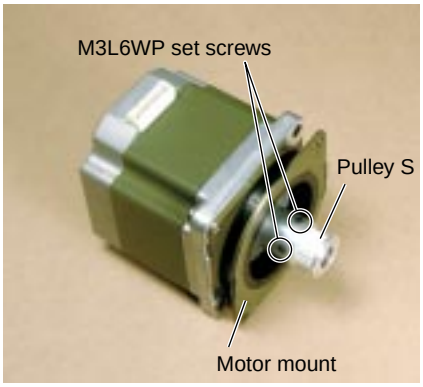
(2) Detach the tension belt.

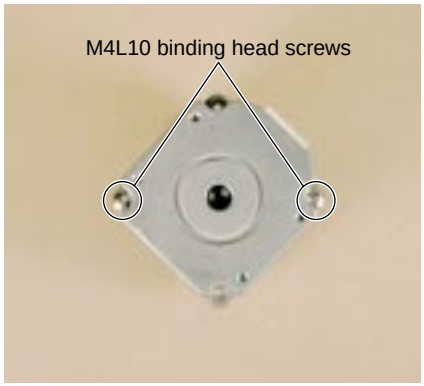


(3) Remove the motor through the hole on the small bottom plate (left side) and detach the connector.

Disassembling the motor

(1) Loosen the M3L6WP set screws to detach the small pulley small (Pulley S).
Remove the two silver M8L10 binding head screws holding together the motor and motor mount.



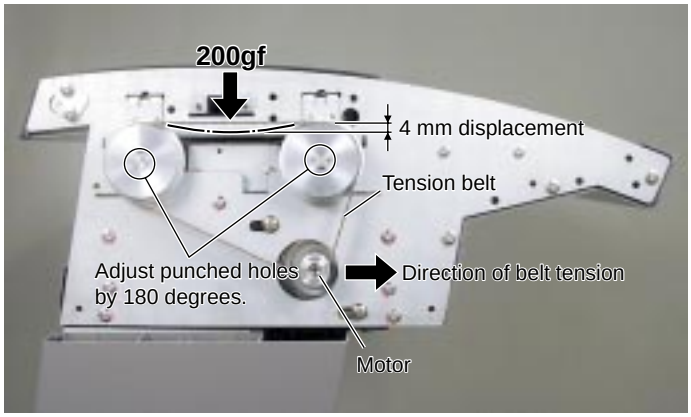


Reattaching the motor

(1) Reattach the motor by reversing the sequence of steps in which it was detached.

Adjusting the Tension Belt

(1) Use the Colex gauge to adjust the belt tension so that the belt displacement is approximately 4 mm when pressed with a force of 200 gf. To do this, attach the motor at different positions until you get the correct displacement.



⚠CAUTION

Always keep the belt under tension with respect to the 180-degree punched markings of the drive roller shaft.

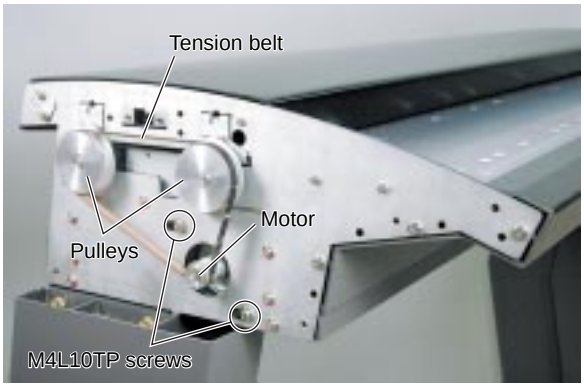
8.21 Pulleys

Disassembly procedure

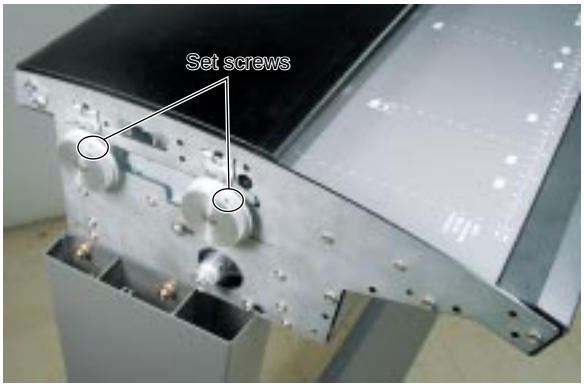
8.2 p.8-2	→	8.4 p.8-5	→	This Section
Detaching the document hold-down unit		Detaching the side cover (the left-hand side cover only)		Detaching the pulleys

Detaching the pulleys

(1) Loosen the two silver M4L10TP screws securing the motor and detach the tension belt.



(2) Loosen the set screws and remove the pulleys.



Reattaching the pulleys

(1) Reattach the pulleys by reversing the sequence of steps in which they were detached.

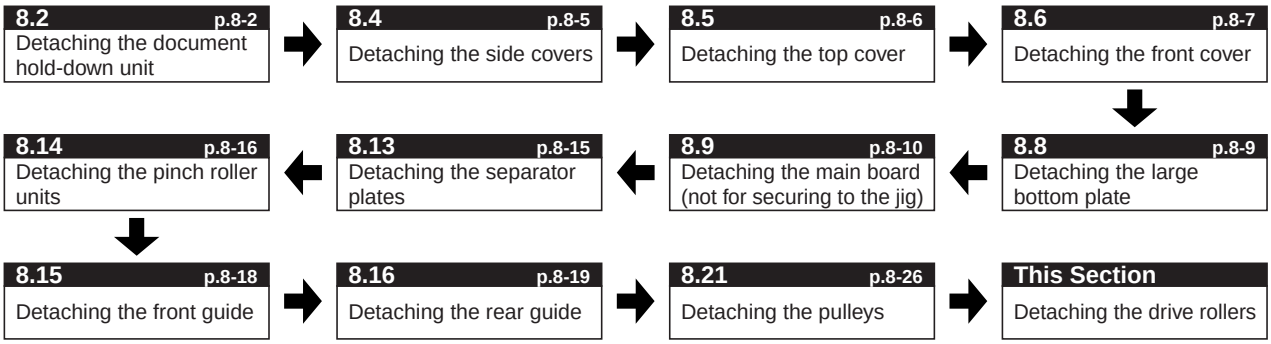
(2) Push each pulley as far as it will go and secure with the set screw.

Adjusting the Tension Belt

See the previous page.

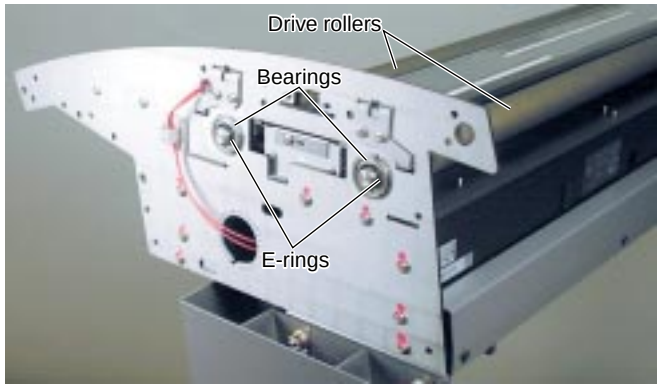
8.22 Drive Rollers

Disassembly procedure



Detaching the drive rollers

(1) Detach the right-hand E-ring.



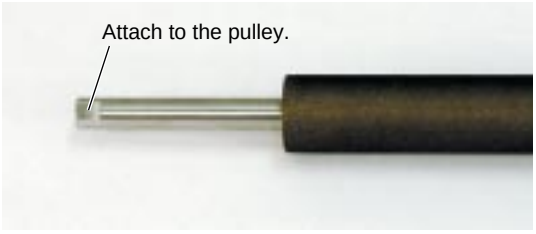
(2) Push the bearings (two per side) from inside the scanner unit to remove them.

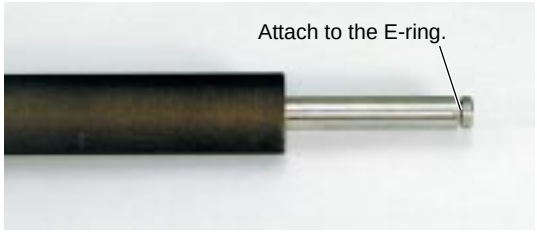
(3) Remove the halves of each drive roller one at a time.

Reattaching the drive rollers

(1) Reattach the drive rollers by reversing the sequence of steps in which they were detached.

(2) Make sure the right-hand and left-hand halves of the roller are attached to the E-ring and pulley, respectively.

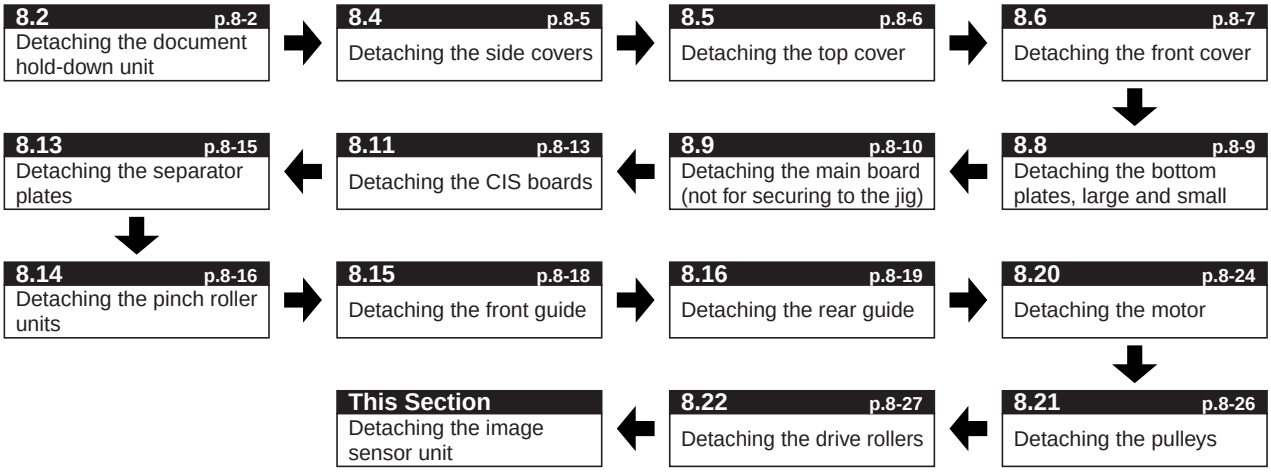




8.23 Image Sensor Unit

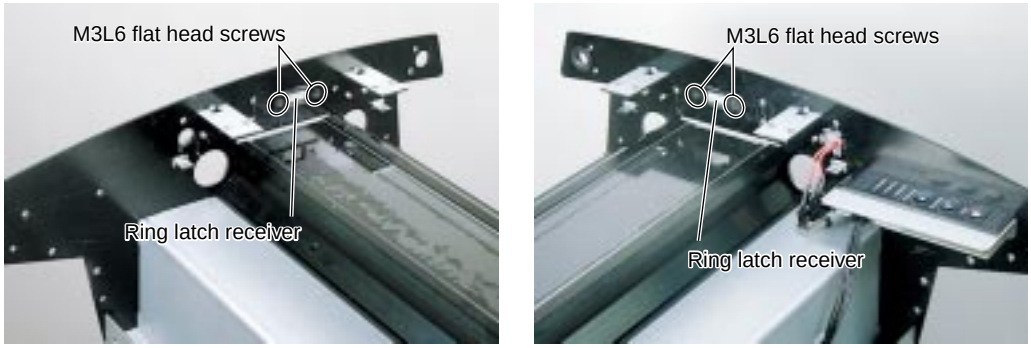
Replacing the Entire Image Sensor Unit

Disassembly procedure

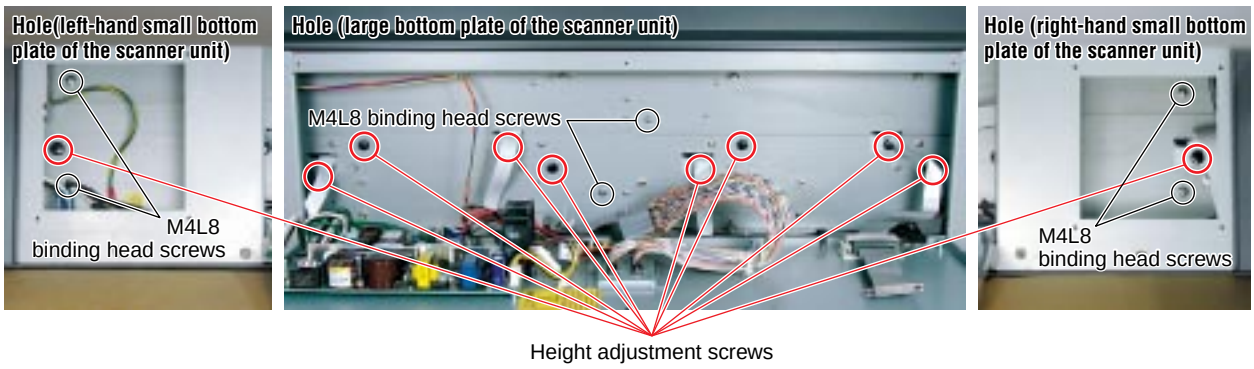


Detaching the image sensor unit

(1) Remove the two black M3L6 flat head screws on each side and detach each ring latch receiver C-42-2.



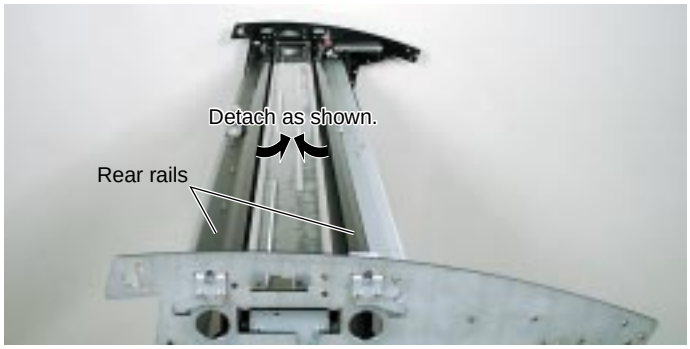
(2) Remove the six silver M4L8 binding head screws inside the bottom section of the scanner unit.


Hole(left-hand small bottom plate of the scanner unit)
M4L8 binding head screws
Hole (large bottom plate of the scanner unit)
M4L8 binding head screws
Hole (right-hand small bottom plate of the scanner unit)
M4L8 binding head screws
Height adjustment screws

⚠CAUTION

Take care to avoid subjecting the height adjustment screws to excessive shock or force.

(3) Pull the rear rails from inside the scanner unit to detach them.



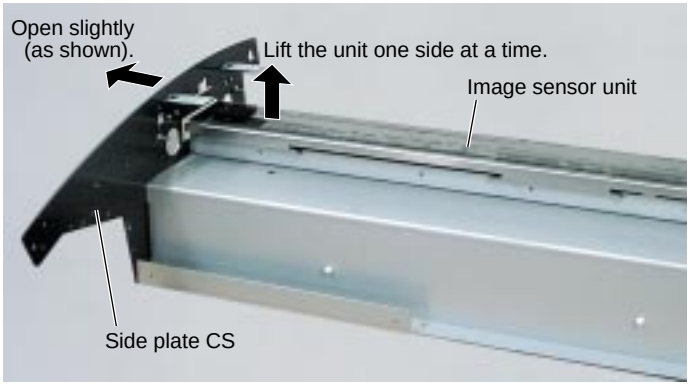
(4) Detach the scanner unit from the stand.

(5) Remove the four silver M4L8 binding head screws on the bottom section of the scanner unit.

⚠CAUTION

When the screws have been removed, the image sensor unit may drop out and sustain damage, depending on the angle at which the scanner unit is tilted. Take care to keep it from falling.

(6) To prevent damage to the scanner unit, open the side plate slightly and lift the image sensor unit one side at a time to detach.



TIP

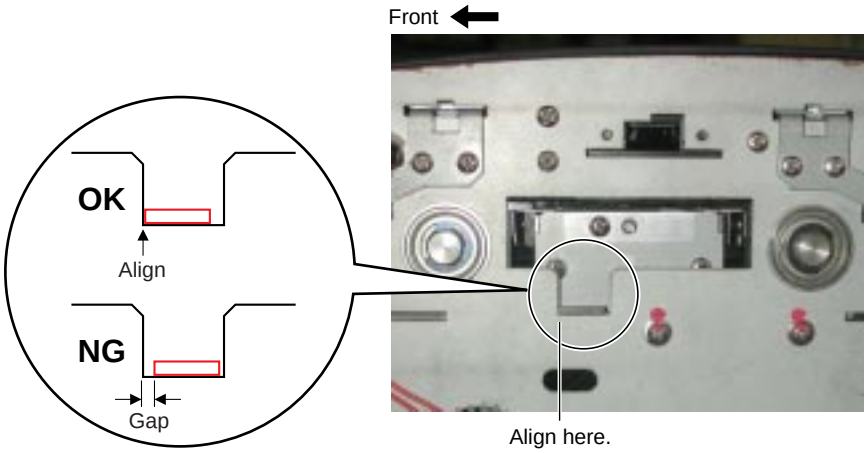
The image sensor unit can be removed more easily if the glass base unit is detached first (see next page).

⚠CAUTION

Always clean inside the image sensor when the glass base has been removed, as dirt or dust inside the unit may affect scanning.

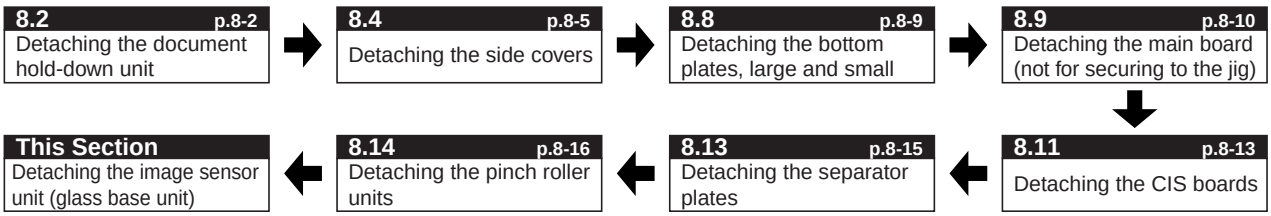
Reattaching the image sensor unit

(1) Reattach the image sensor unit by reversing the sequence of steps in which it was detached.
Align the image sensor with the front of the main unit when attaching the sensor.



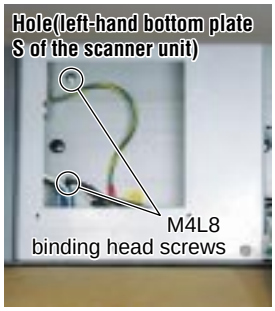
Replacing the Glass Base Unit Only

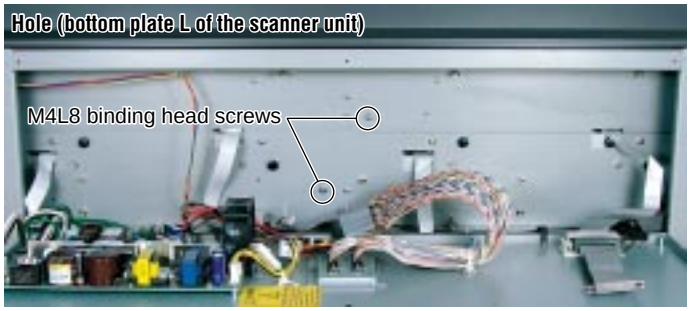
Disassembly procedure

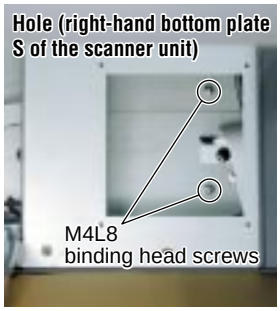


Detaching the glass base unit

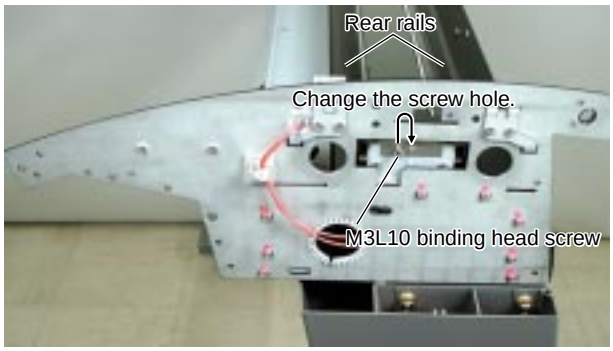
(1) Remove the six silver M4L8 binding head screws inside the bottom section of the scanner unit and loosen the rear rails.

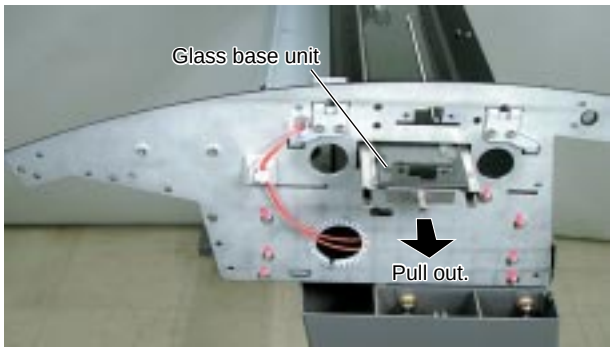






(2) Remove the silver M4L10 binding head screw on the right-hand side of the image sensor unit and insert into the screw hole adjacent to the original hole. Detach the glass base unit.





⚠CAUTION

When replacing the glass base unit, be sure to clean the interior of the image sensor unit. A soiled or dusty unit can affect scanning performance.

Reattaching the glass base unit

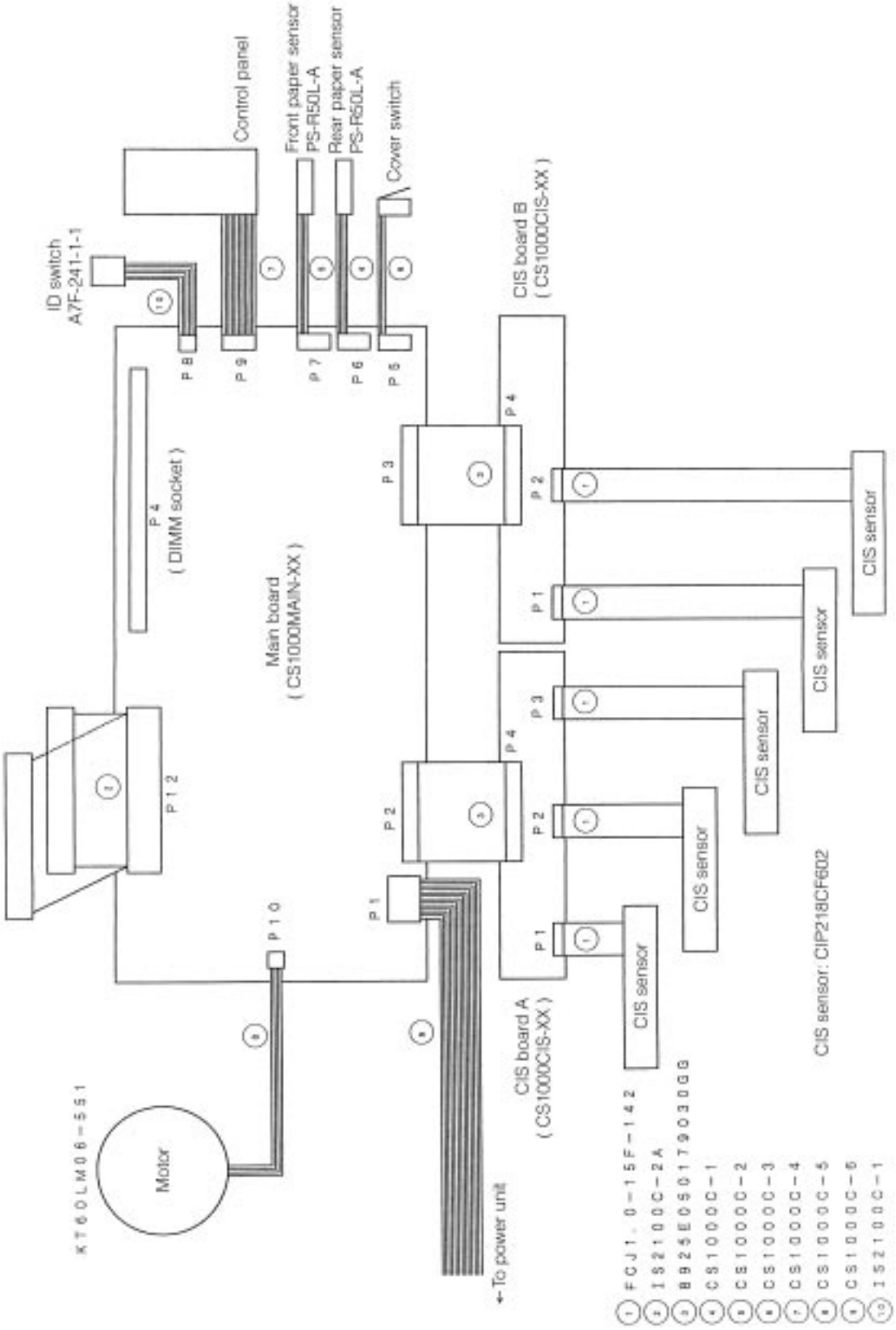
(1) Reattach the glass base unit by reversing the sequence of steps in which it was detached.

(2) Make sure the image sensor unit is properly sandwiched between the rear rails when securing them.

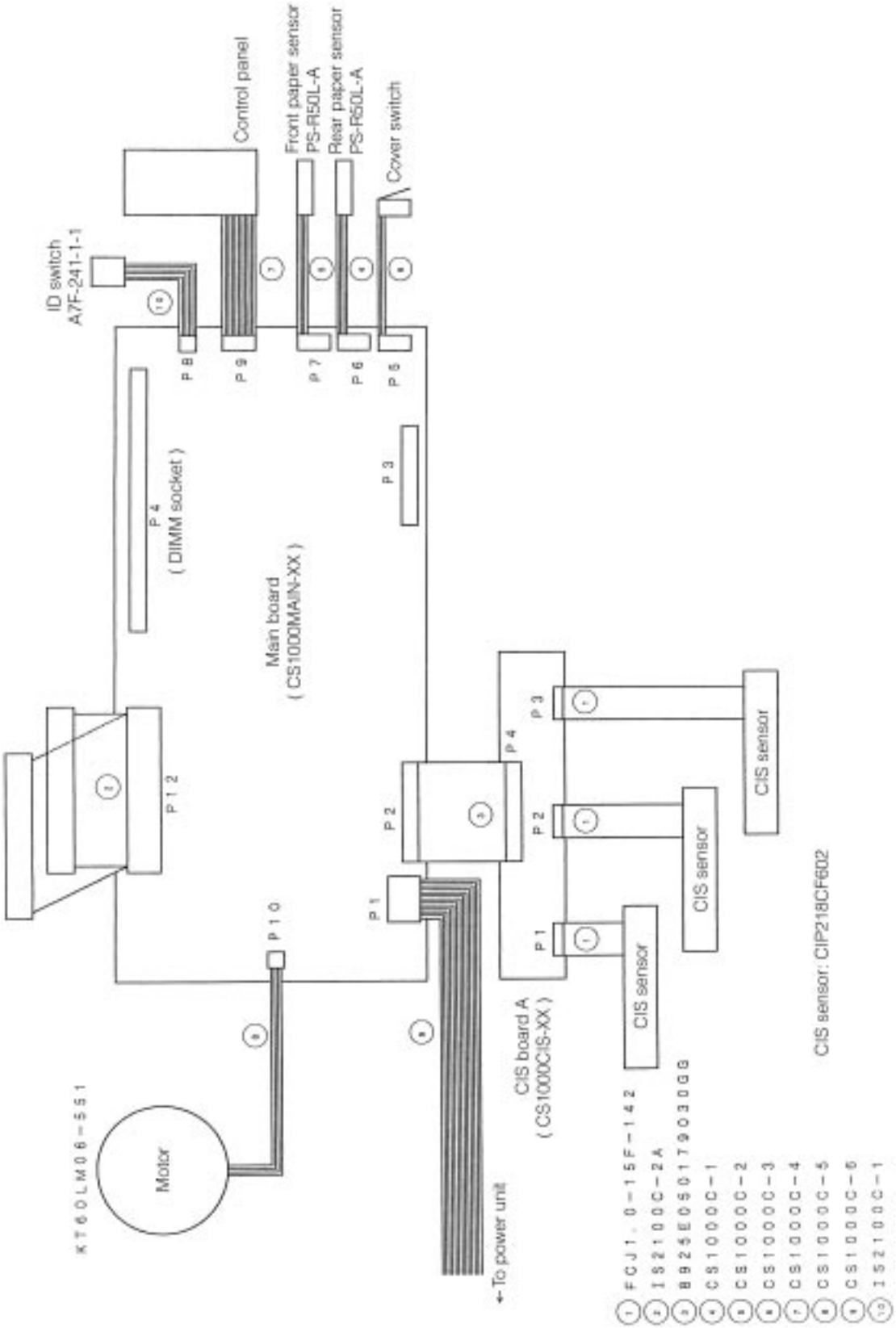
9. BOARDS AND ELECTRICAL COMPONENTS

9.1 Wiring Diagrams

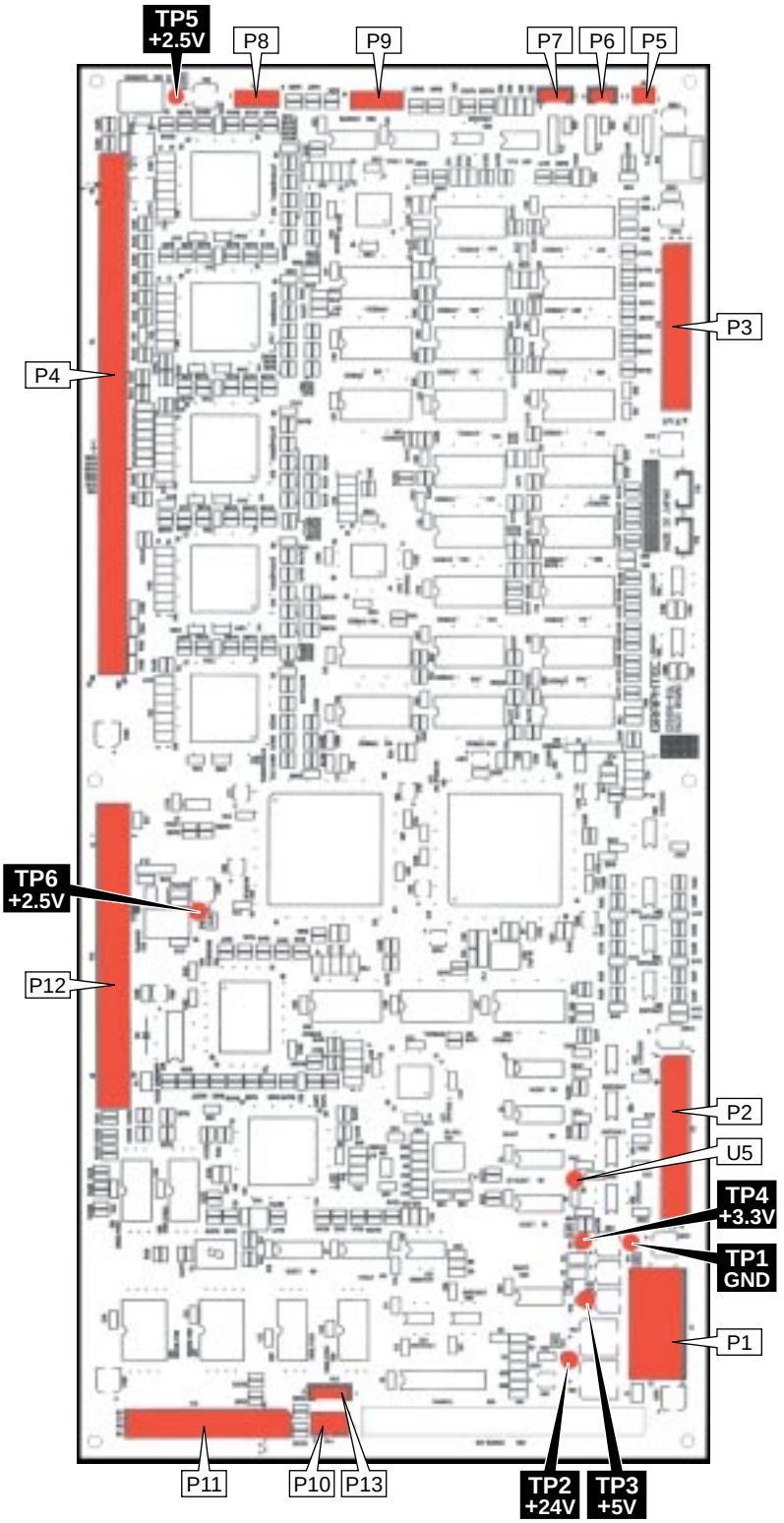
Overall Configuration (CS1000/1000ES)



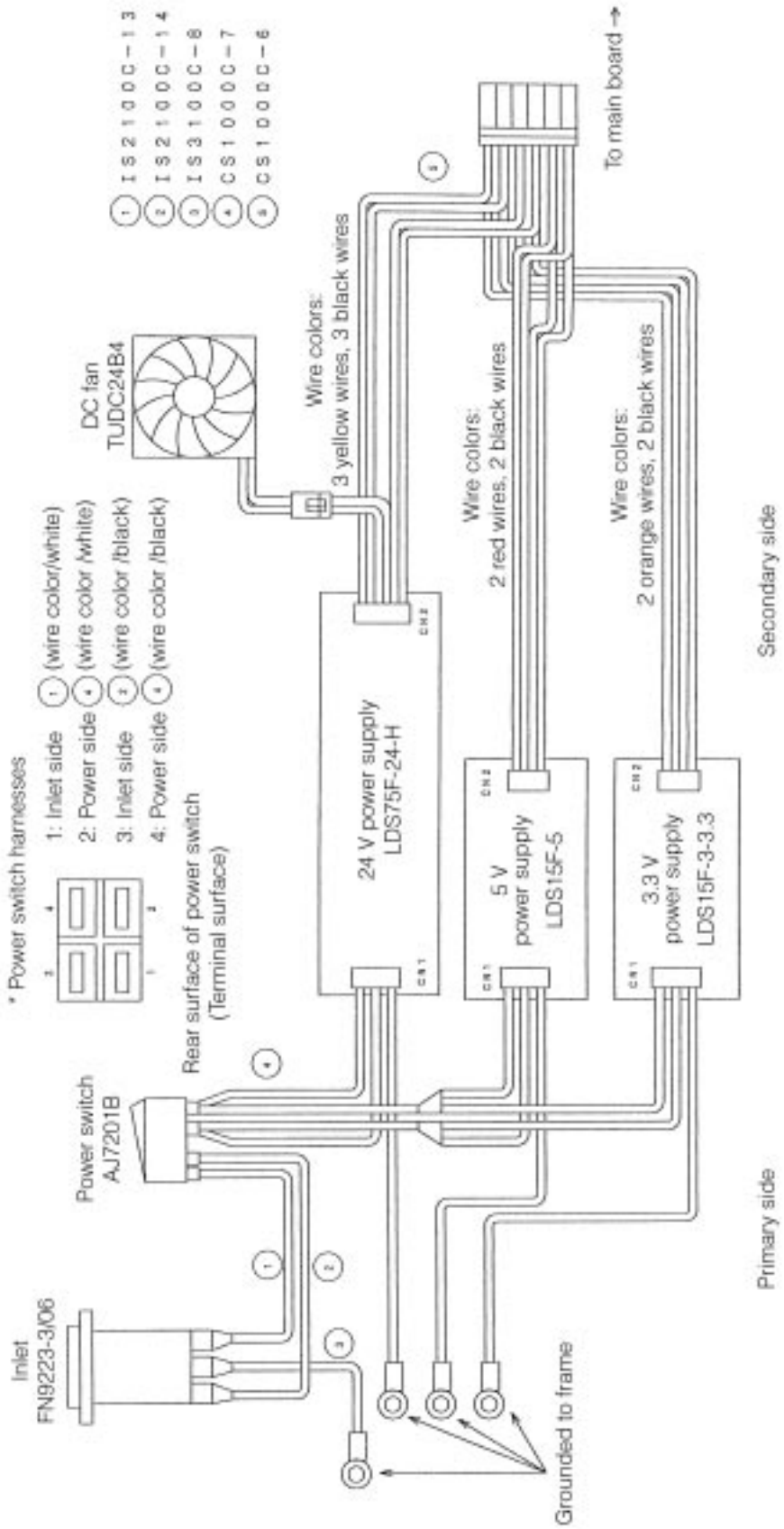
Overall Configuration (CS1100ES)


Control panel
Front paper sensor PS-R50L-A
Rear paper sensor PS-R50L-A
Cover switch
ID switch A7F-241-1-1
P 8
P 9
P 7
P 6
P 5
P 4 (DIMM socket)
P 3
Main board (CS1000MAIN-XX)
P 12
P 10
P 2
P 1
P 4
P 3
P 2
P 1
CIS sensor
CIS sensor
CIS sensor
CIS board A (CS1000CIS-XX)
Motor
K T 6 0 L M 0 6 - 5 5 1
← To power unit
F C J 1 . 0 - 1 5 F - 1 4 2
1 S 2 1 0 0 C - 2 A
B 9 2 5 E 0 S 0 1 7 9 0 3 0 0 G G
C S 1 0 0 0 C - 1
C S 1 0 0 0 C - 2
C S 1 0 0 0 C - 3
C S 1 0 0 0 C - 4
C S 1 0 0 0 C - 5
C S 1 0 0 0 C - 6
1 S 2 1 0 0 C - 1
CIS sensor: CIP218CF602

Component Layout on the Main Board



Power Unit Wiring



9.2 Power Supply Unit

1. Checking Voltage Levels

(1) Turn off the power for the scanner unit.

(2) Detach the connector (CN2) from the power board before checking voltage levels.

(3) Turn on the power for the scanner unit and check voltage levels between the pins listed below.

⚠CAUTION

When making measurements, take care to prevent shorting the ground and output terminals.

The output voltage levels and permissible ranges are given below.

3.3 V power supply (LDS15F-3-3.3)

Pin No.	Output voltage	Permissible range
1	+0V	
2	+0V	
3	+3.3V	+3.25V to +3.35V
4	+3.3V	+3.25V to +3.35V

When checking for +3.3 V, use Pin No.1 or 2 as the ground terminal.

5 V power supply (LDS15F-5)

Pin No.	Output voltage	Permissible range
1	+0V	
2	+0V	
3	+5V	+4.9V to +5.1V
4	+5V	+4.9V to +5.1V

When checking for +5 V, use Pin No.1 or 2 as the ground terminal.

24 V power supply (LDS75F-24-H)

Pin No.	Output voltage	Permissible range
1	+0 V	
2	+0 V	
3	+0 V	
4	+24 V	+23.5 V to +24.5 V
5	+24 V	+23.5 V to +24.5 V
6	+24 V	+23.5 V to +24.5 V

When checking for +24 V, use any of Pin Numbers 1 through 3 as the ground terminal.

9.3 Main Control Board

1. Precautions for replacing the main board

(1) Before replacing the main board, note the feed correction value, X overlap and Y offset values currently selected for the scanner, if these values can be checked. (To check these values, follow the procedure given in "Preparations before Making Adjustments" in Section 10.2 on p. 10-3.)

(2) Use Scanning Master 21+ to make adjustments.

2. Checking voltage levels

(1) Remove the bottom cover.

(2) You will find test pins (TP1 through TP6) in the lower left corner of the main control board. The output voltage levels of these pins are given below:

Test pin		Output voltage	Permissible range
No.	Name		
TP1	GND	+0 V	
TP2	+24 V	+24 V	+23.5V to +24.5V
TP3	+5 V	+5 V	+4.9V to +5.1V
TP4	VCC	+3.3 V	+3.25V to +3.35V
TP5, 6	+2.5 V	+2.5 V	+2.4V to +2.6V

3. LED status

An LED is provided on the main control board.

U5: Red when the CPU is running.
U5: Remains unlit when the CPU is not running (when an error occurs).

4. Replacing the main board

(1) Before replacing the main board, note the feed correction value, X overlap and Y offset values currently selected for the scanner, if these values can be checked. (To check these values, follow the steps given in "Preparations before Making Adjustments" in Section 10.2 on p. 10-3.)

(2) Remove the bottom cover and disconnect all cables from the main control board.

(3) Remove the six screws securing the main control board.
(See "Main Board" in Section 8.9 on p. 8-10.)

(4) Detach the SDRAM from the P4 connector and install on the new main board.

(5) Attach the new main board by reversing the sequence of steps in which the old board was removed.

(6) Initialize offset by setting DIP switch 2 on the scanner unit to the ON position; then turn ON power while pressing and holding the STOP key.

(7) Perform shading (white correction). (See "Shading (white correction)" on p. 10-5.)

(8) Adjust the feed distance. (See "Adjusting feed distance" on p. 10-6.)

(9) Adjust the offset (origin). (See "Adjusting offset (origin)" on p. 10-8.)

(10) Align the sensor images (X overlap, Y offset). (See "Sensor joint aligning" on p. 10-10.)

(11) Perform shading (undesired color line removal). (See "Shading (undesired color line removal)" on p. 10-13.)

(12) Perform shading (undesired gray line removal). (See "Shading (undesired gray line removal)" on p. 10-15.)

(13) Check the sensor color density. (See "Checking sensor color density" on p. 10-18.)

(14) Turn off power and set all DIP switches to the OFF position (normal operation mode).

9.4 At-a-glance Guide to Adjustment Functions

Press one of the keys shown below at power-on to select the corresponding mode.

Key operations

Set DIP switch 2 to the ON position and press one of the keys shown below at power-on to select the corresponding adjustment mode.

MODE \ KEY	FORWARD	REVERSE	STOP
Offset initialization (*1)	–	–	Press
Shading correction	Press	–	–

*1: Offset initialization resets all settings stored in NVRAM to their default values.
(Feed correction, origin, X overlaps, Y offsets, and density values will be reset to their defaults.)

9.5 Downloading the Boot Program

The flash memory of a new main control board has no data stored in it. For this reason, you need to download the boot program from EPROM to flash memory. This makes it possible for the SCSI interface to perform basic operations. However, note that the flash memory provided on the main board for maintenance purposes contains the boot program. Thus, you do not need to download the program.

1. Items required to download the boot program

- CS1000 boot ROMs (ODD, EVEN): EPROMs with CS1000INSTXX programs stored
- CS1000 scanner
- CS1000 ROM jigs (used also for the IS3100)

2. Procedure

(1) Open the large bottom plate and confirm that the power board and the control panel are connected to the main control board.

(2) Attach the EVEN and ODD EPROMs respectively to ROM jigs U1 and U2.

(3) Insert them into P11 on the main board.

(4) Turn on the power switch. At this time, program downloading begins automatically.

(5) When the download is complete, the LED on the main board (CS1000MAIN-[ ][ ]) should begin flashing. When the LED flashes, turn off power.

(6) Detach the ROM jigs and close the large bottom plate.

9.6 Downloading Firmware

This section describes how to download firmware (system programs) via the SCSI interface to the flash memory provided on the main board, to which the boot program has been downloaded.

1. Items required to download firmware

- CS1000.X file
- CS1000 scanner
- PC (Windows 95 or 98 and an operating environment that provides SCSI compatibility)
- OPS112 (Scanning Master 21+ Ver 3.01 or later)
- SCSI interface cable

2. Procedure

To update the firmware, follow steps (1) to (7).
To download firmware for a new main board, follow steps (8) and (9).

(1) Attach the main board to the CS1000 and use the SCSI cable to connect the CS1000 and PC.

(2) Set DIP switches 1, 2, and 3 to the ON positions and switch on power for the CS1000.

(3) Turn on power for your PC and start OPS112.

(4) When OPS112 starts, follow the steps given below to download the firmware.
1. Access the "Help" menu and select "About." At this time, a dialog box will appear.
2. Point to the icon in the window and click while pressing and holding the "Ctrl" key.
3. Click the "OK" button while pressing and holding the "Shift" key. This makes the status available for adjustment.
4. Select "Adjust Scanner" from the "Tools" menu to display the Adjust Scanner window.
5. Select "Update Scanner/Firmware" to display the Download dialog box.

(5) Insert the floppy disk containing the firmware (filename: CS1000.X) into the floppy disk drive, click the "View" button on the Download dialog box, select the floppy disk, and click the "OK" button.

(6) Click the "Start" button to begin downloading.

(7) After the download is complete, a message will appear. At this time, all the panel control LEDs on the scanner should start flashing simultaneously.
After confirming the download, set all the DIP switches to "OFF," and then switch off power.

(8) When the download is complete, a message will appear. At this time, all panel control LEDs on the scanner should start flashing at the same time.
After confirming this, turn off power and set DIP switches 1 and 3 to the OFF positions. Switch on power again while pressing and holding the "STOP" key on the control panel.
Initialization is complete when the "POWER" LED lights up by itself, followed by the "ERROR" LED, and then the "ERROR" LED will then go out.

(9) Next, set DIP switch 2 to the OFF position and switch on power once again for initialization to take effect.

9.7 Test Mode

RAM, panel operations, and SCSI ID switch operation tests may be performed.

1. Procedure

(1) Set DIP switch 3 to the "ON" position.

(2) Select the following combinations of DIP switches 1 and 2 to perform the tests.

DIP SW1	DIP SW2	Description
OFF	ON	RAM check The Paper LED lights if no problems are found with RAM. The Error LED lights if a RAM error has occurred.
ON	OFF	Panel operation test The Power LED lights when the "FORWARD" key is pressed. The Paper LED lights when the "REVERSE" key is pressed. The Error LED lights when the "STOP" key is pressed.
OFF	OFF	SCSI ID switch read test Confirm that the selected ID matches the corresponding combination of LED statuses. The LED statuses should be as shown below.

ID	LED statuses
0	Error– ●, Paper– ●, Power– ●
1	Error– ○, Paper– ●, Power– ●
2	Error– ●, Paper– ○, Power– ●
3	Error– ○, Paper– ○, Power– ●
4	Error– ●, Paper– ●, Power– ○
5	Error– ○, Paper– ●, Power– ○
6	Error– ●, Paper– ○, Power– ○
7	Error– ○, Paper– ○, Power– ○

● : Unlit, ○ : Lit

10. ADJUSTMENTS WITH SOFTWARE

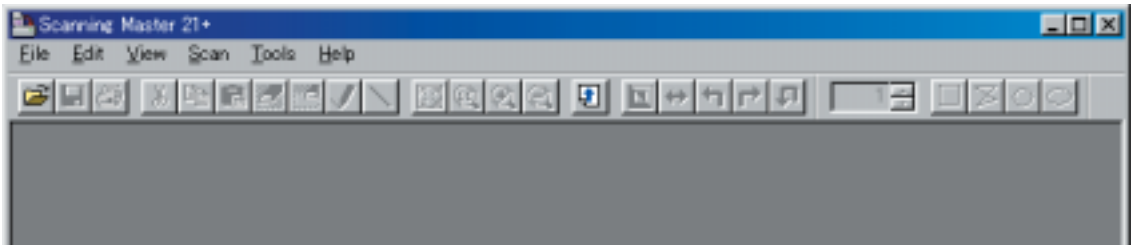
10.1 Starting the Software

• Ensure that OPS112 (ScanningMaster 21+ Ver 3.15 or later) is installed.
• Set DIP switch 2 on the scanner to "ON."

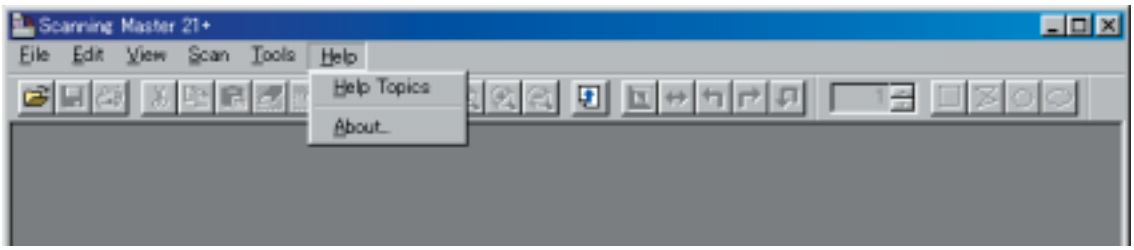
(1) Connect the scanner to the PC using a SCSI cable and switch on the scanner.

(2) Start Windows (OS).

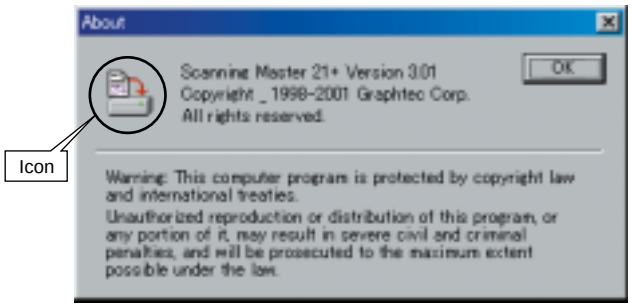
(3) Start OPS112 (ScanningMaster 21+).



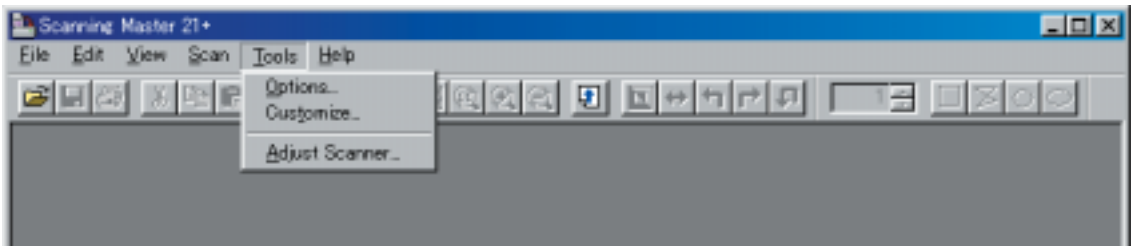
(4) Select "About" from the "Help" menu.



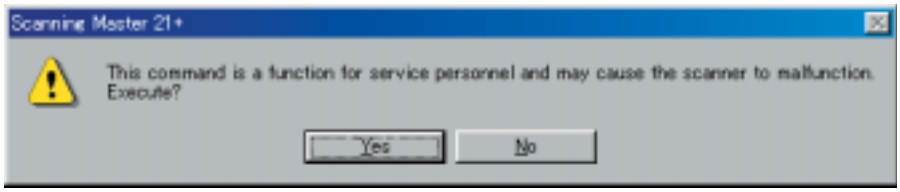
(5) Click the scanner icon while pressing and holding the "Ctrl" key.
Next, click the "OK" button while pressing and holding the "Shift" key.


About
Scanning Master 21+ Version 3.01
Copyright _ 1998-2001 Graphtec Corp.
All rights reserved.
OK
Icon
Warning: This computer program is protected by copyright law and international treaties.
Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.

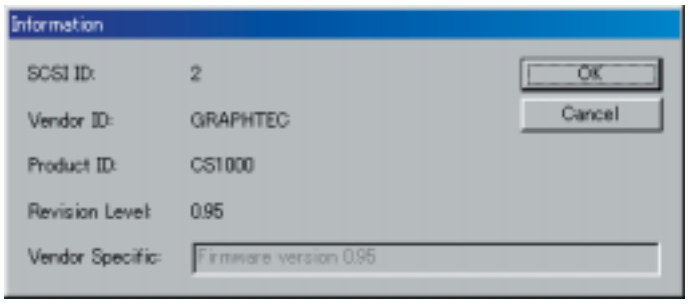
(6) Select "Adjust Scanner" from the "Tools" menu.

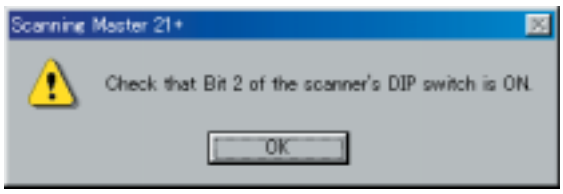


(7) Select "Yes".


Scanning Master 21+
This command is a function for service personnel and may cause the scanner to malfunction.
Execute?
Yes
No

(8) When you click the "OK" button in the following windows, the Adjust Scanner window will appear with the Adjust menu.





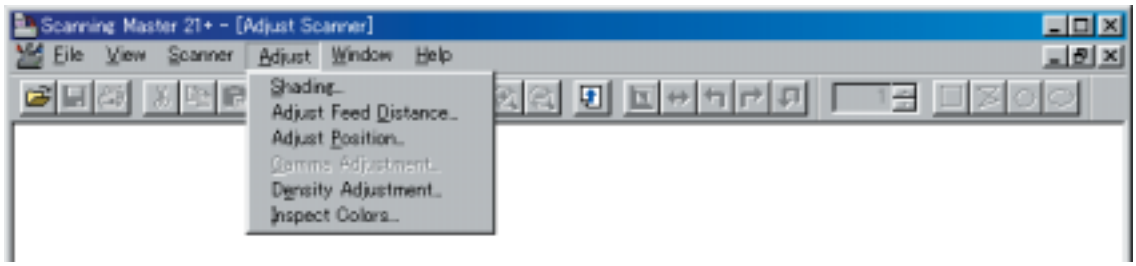
10.2 Preparations before Making Adjustments

Note the current feed distance adjustment and position adjustment values while making adjustments.
This enables the values to be entered directly from the keyboard to restore the scanner to its previous status if adjustment fails.
In main board replacement, the time required for adjustment can be reduced by setting the previously noted feed distance adjustment and position adjustment values. However, for image sensor unit replacement, all settings must be adjusted, eliminating the need to record the previous values.

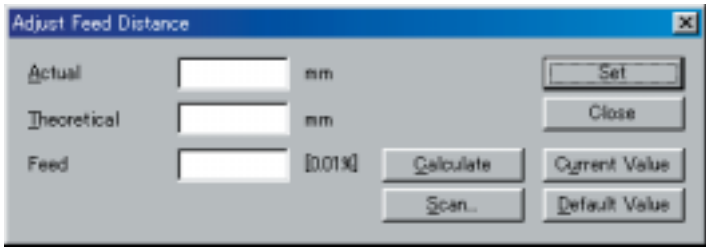
Adjustment procedure

(1) Start Scanning Master 21+. (See p. 10-1.)

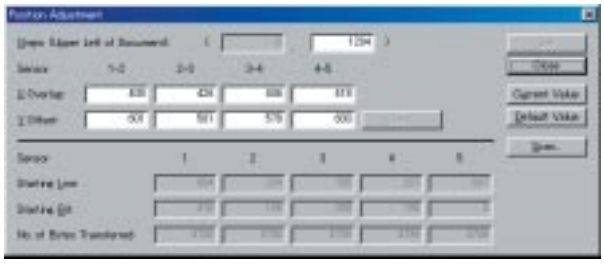
(2) Select "Adjust Feed Distance" from the "Adjust" menu.



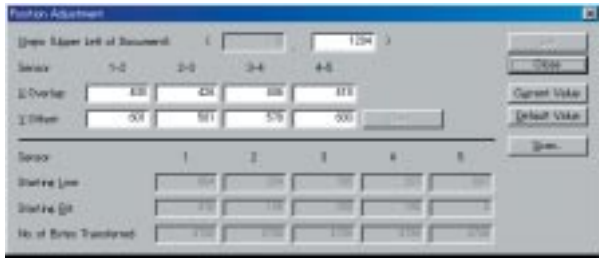
(3) Click the "Current Value" button and note the value shown in the Feed box. After finishing, click the "Close" button.



(4) Similarly, select "Adjust Position" from the "Adjust" menu and click the "Current Value" button. Note the values shown in the X Overlap and Y Offset boxes and click the "Close" button.



CS1000/1000EV



CS1100EV

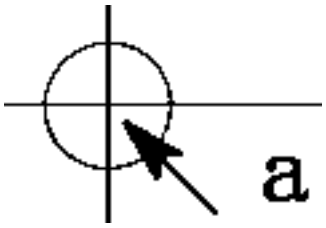
10.3 Preparing a Test Chart

(1) Prepare a CS1000 or CS1100 adjustment test chart.

(2) Make sure that the distances (measured with a glass scale) between the two points in all pairs are included in the chart in advance. (See the chart shown above.)

<<Tip 1>> Test chart is made of Mylar paper.
For use in normal office environments (normal temperatures and humidity levels), you should only need to measure each distance once.
Make sure that each distance is measured with the utmost accuracy.

<<Tip 2>> Make sure that all staff members using this test chart select the same measurement points.
This chart has been designed with the assumption that the point shown below is used for measurement.



<<Tip 3>> If the user-specified paper must be used for adjustments, you should make the measurements over as long a period of time as possible to obtain good results.

10.4 Making Adjustments

Always follow the sequence given below when making adjustments.

1. Shading (white correction)
2. Feed distance adjustment
3. Position adjustment
Offset adjustment
Sensor joint alignment
4. Shading (undesired color line removal)
5. Shading (undesired gray line removal)

1. Shading (white correction)

(1) Prepare a shading paper (large format). For the CS1100EV, use the small-format shading paper. Clean the scanner glass, document table, and document hold-down unit.

(2) Switch on the scanner, place the right-hand side of the shading paper against the edge of the main unit control panel, and press the "FORWARD" key. Continue pressing the "FORWARD" key until the front side of the paper is positioned so that it protrudes slightly from the rear of the scanner. Then turn off the scanner.

CHECKPOINT

Position the shading paper with the glossy side facing up.

(3) Confirm that DIP switch "2" is set to the "ON" position.

(4) Turn on the scanner while pressing and holding the "FORWARD" button on the control panel. Hold down the button until only the "POWER" LED on the panel lights.

CHECKPOINT

The "ERROR" and "PAPER" LEDs alternately flash for 8 minutes during shading.

Later, the "ERROR" LED will light several times. (Period of time required for shading: approximately 20 to 30 minutes)

(5) All LEDs flash when all shading data has been written.

CHECKPOINT

The paper will move several times during shading. This is perfectly normal.

(6) Turn off the scanner once, then turn it on again.

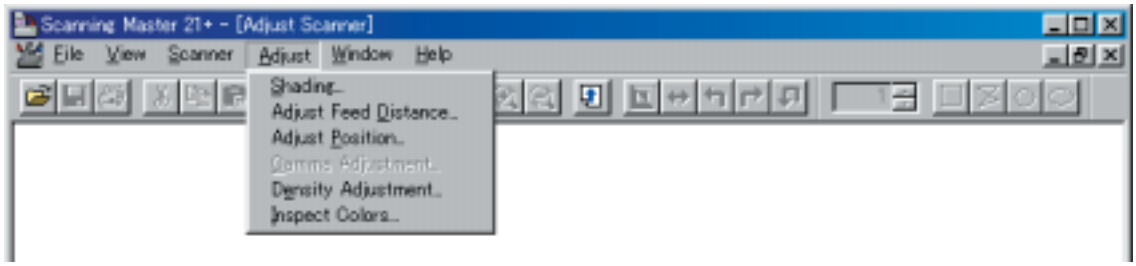
(7) Press the "REVERSE" button to eject the shading paper.

2. Feed distance adjustment

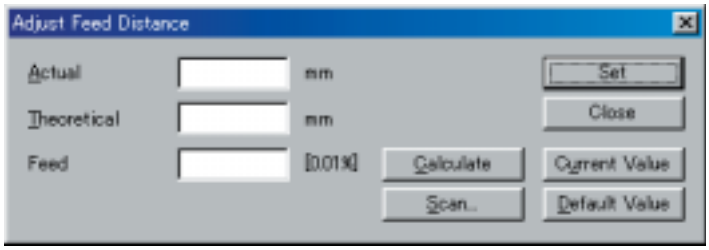
Set DIP switch 2 on the scanner to "ON."

(1) Start the software. (See p. 10-1)

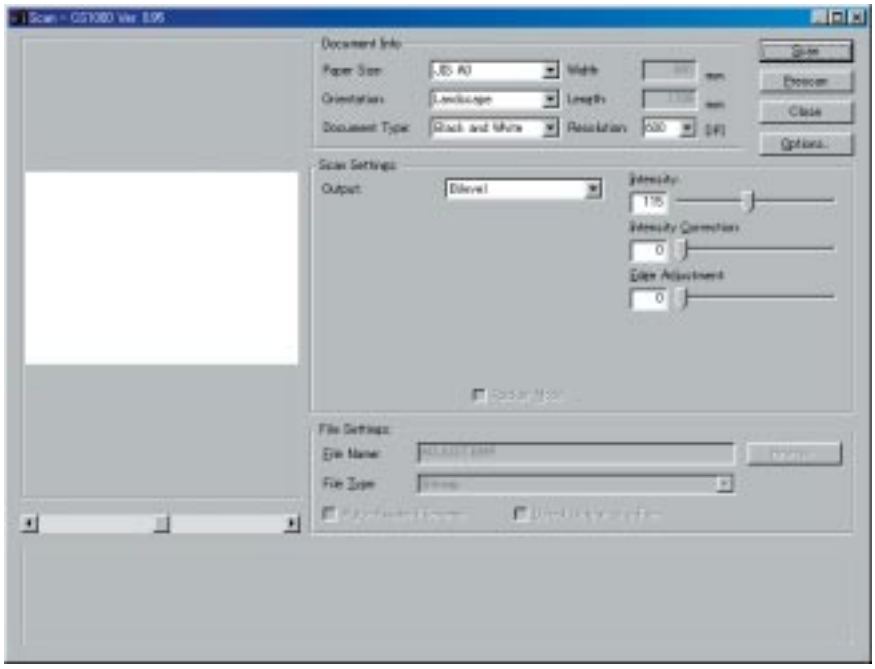
(2) Select "Adjust Feed Distance" from the "Adjust" menu.



(3) The following dialog box will appear: Correctly position the test chart on the scanner and click the "Scan" button.



(4) The following dialog box will appear: Click the "Scan" button.

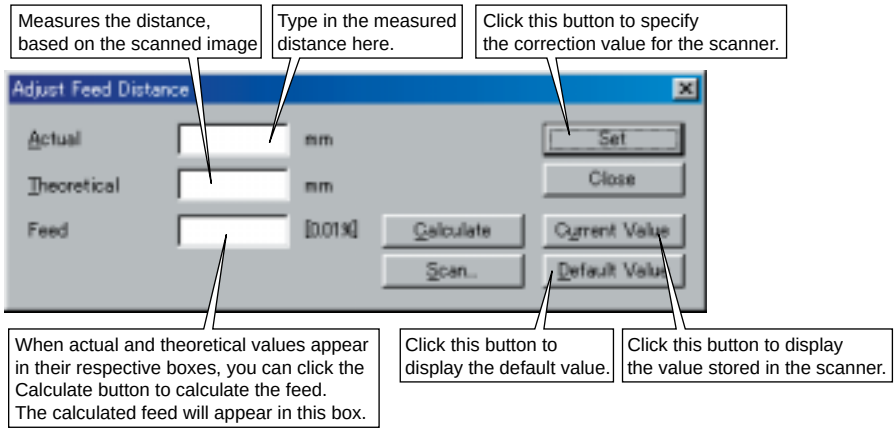


Select the following for "Document Info" and "Scan Settings":

"Document Info" Paper Size: JIS A0 (CS1100: JIS A1), Document Type: Black and White, Resolution: 600 dpi

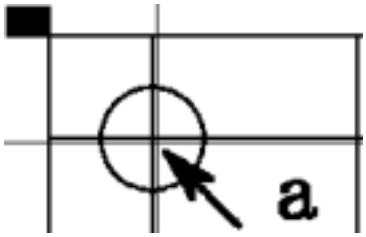
"Scan Settings" Output: Bilevel, Intensity: 115, Intensity Correction: 0, Edge Adjustment: 0

The following dialog box appears, together with the scanned image.

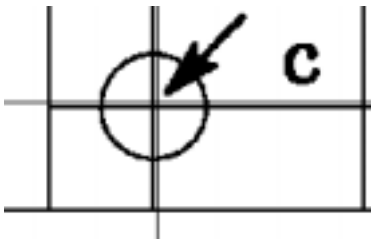

Measures the distance, based on the scanned image
Type in the measured distance here.
Click this button to specify the correction value for the scanner.
Adjust Feed Distance
Actual
mm
Theoretical
mm
Feed
[0.01%]
Set
Close
Calculate
Current Value
Scan...
Default Value
When actual and theoretical values appear in their respective boxes, you can click the Calculate button to calculate the feed. The calculated feed will appear in this box.
Click this button to display the default value.
Click this button to display the value stored in the scanner.

(5) Type the distance between a and c measured with a glass scale in the "Actual" box.

(6) Click anywhere within the "Theoretical" box and use the crosshairs cursor to click the white corner indicated by arrow "a" on the scanned image.



(7) Scroll the scanned image to click the white corner indicated by arrow "c" with the crosshairs cursor.



(8) The measured distance appears in the "Theoretical" box. Click the "Calculate" button.

(9) The correction value appears in the "Feed" box.
Click the "Set" button to allow the scanner to store the correction value.

(10) Place the test chart on the scanner again and click the "Scan" button.

(11) Repeat Steps 5 through 7 to perform the following calculations, based on the figures displayed in the dialog box.

[(Theoretical value - Actual value) / Actual value] x 100%

<< Factory setting >> Confirm that this value is within ±0.05.
<< During servicing >> Confirm that this value is within ±0.07.

CHECKPOINT

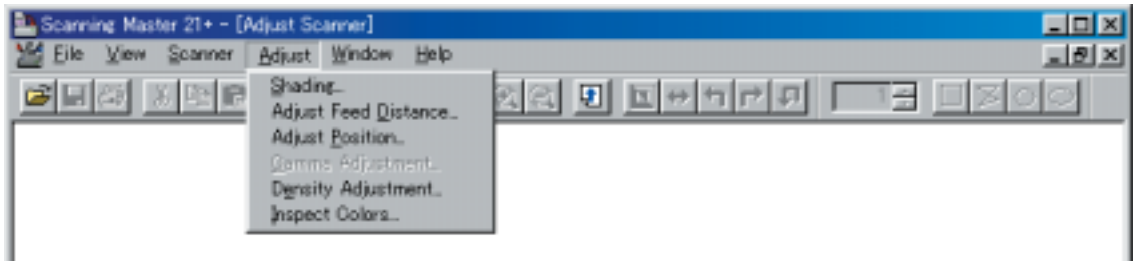
The scanner may be defective if the calculated values do not fall within the above ranges.

3. Position adjustment

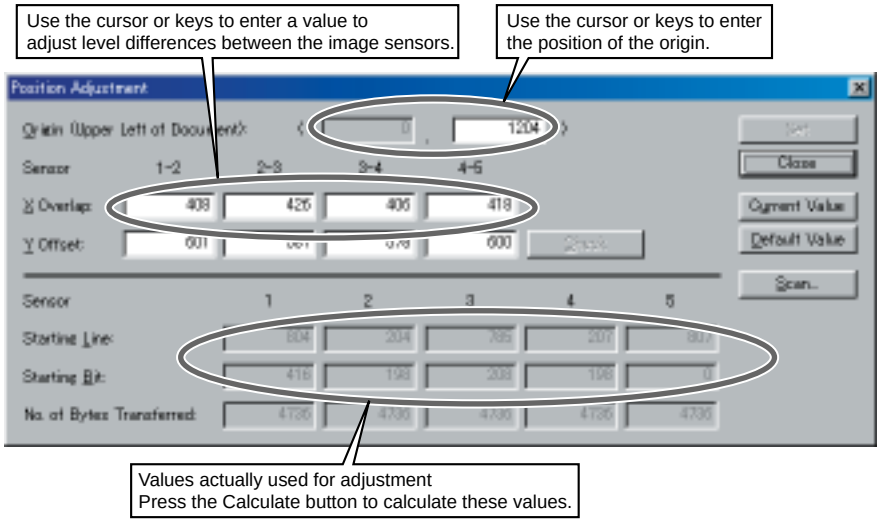
Set DIP switch 2 on the scanner to "ON."
Adjusting offset (origin)

(1) Start the software. (See p. 10-1)

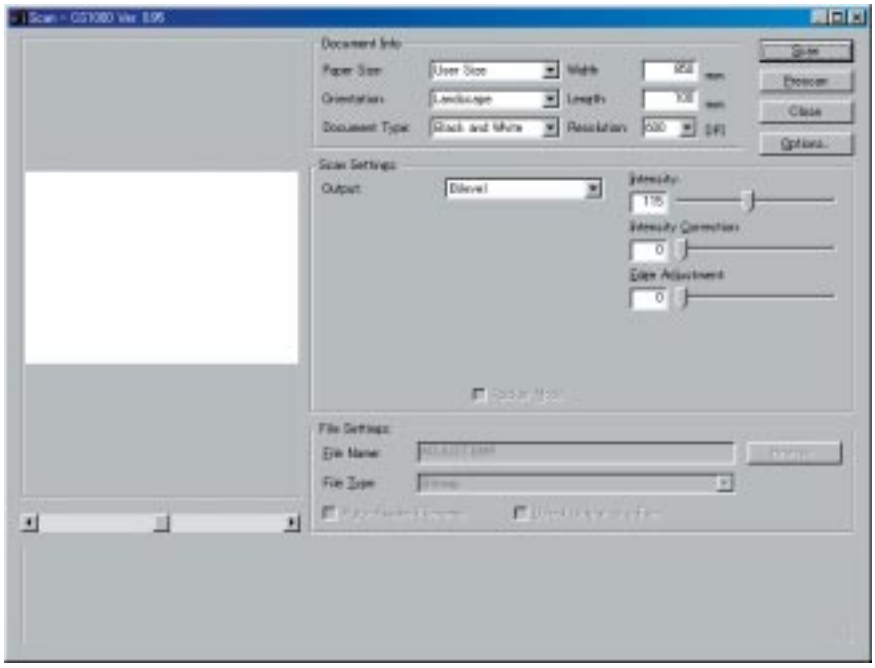
(2) Select "Adjust Position" from the "Adjust" menu.



(3) The following dialog box will appear: Correctly position the test chart on the scanner and click the "Scan" button.



(4) The following dialog box will appear: Click the "Scan" button.

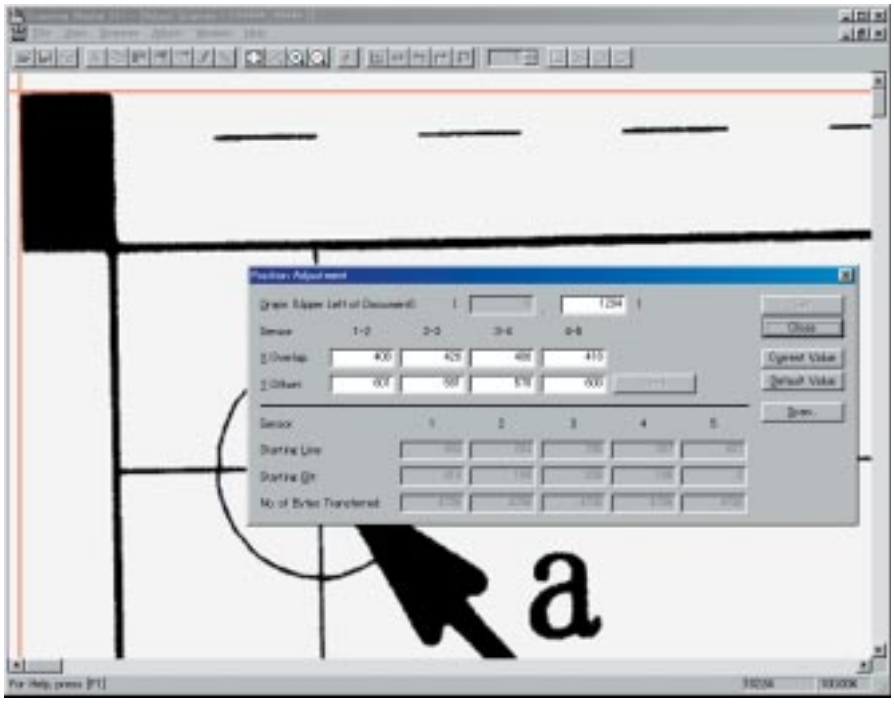


Scan conditions:

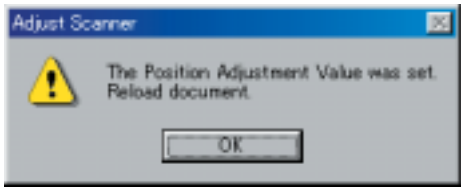
"Document Info"
Paper Size: JIS A0
(CS1100: JIS A1)
Document Type:
Black and White
Resolution: 600 dpi

"Scan Settings"
Output: Bilevel
Intensity: 115
Intensity Correction: 0
Edge Adjustment: 0

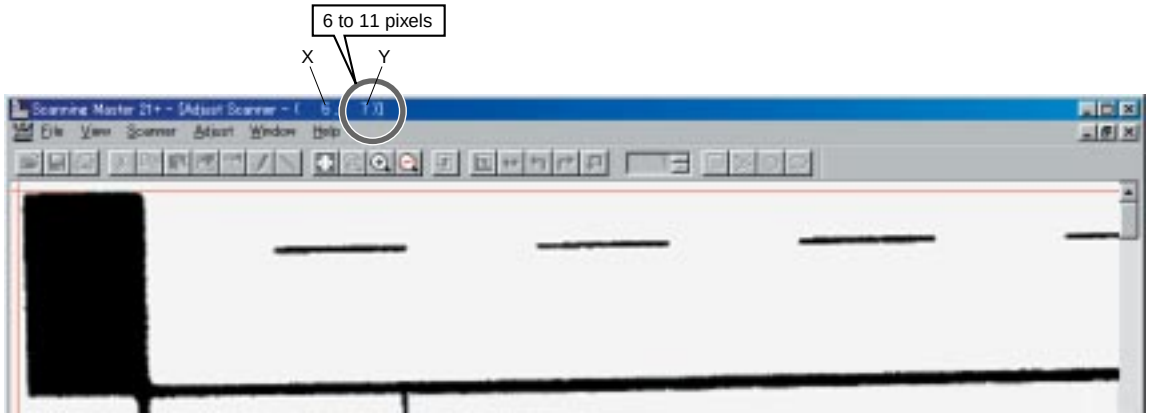
(5) A dialog box appears together with the Adjust Scanner window, as shown below.
Click anywhere within the Origin box. When the crosshair cursor appears in the Adjust Scanner window, click on the dark rectangle at the top left of the Adjust Scanner window with the crosshair cursor.
Click anywhere within the Origin box and enter the coordinates displayed after subtracting 8.



(6) Click the "Check" button, then click the "Set" button. The following dialog box will appear.
Click the "OK" button, then press the "▼" button while pressing the "Stop" button. Reposition the paper on the scanner.



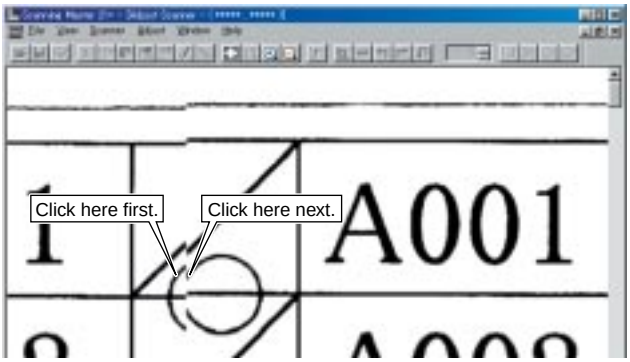
(7) Click the "Scan" button to redisplay the scanned image. Confirm that the dark rectangle is between 6 and 11 pixels from the window edge.



(8) When the scanned image is between 6 and 11 pixels, you may proceed with sensor image alignment.

Sensor joint adjustment (X overlap, Y offset)

(1) When continuing with sensor joint alignment after offset adjustment, scroll the adjusted image to display the portion shown below.
If you start with sensor joint alignment, follow Steps (1) through (4) in "Adjusting offset (origin)" on p. 10-8 to display the scanned image, and scroll to display the portion shown below.



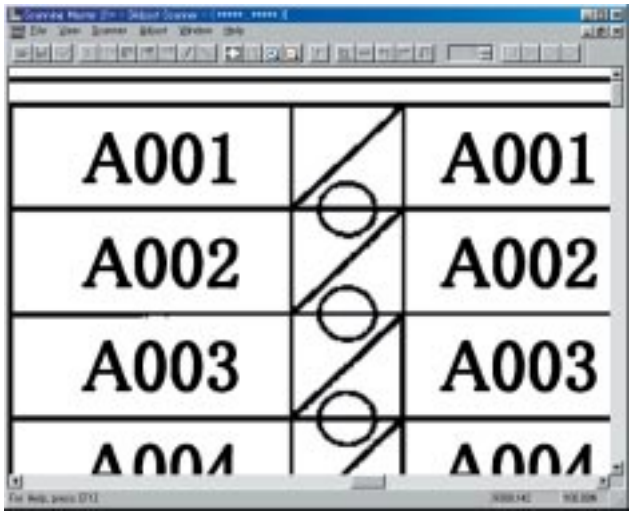
(2) The image appears as shown above, with the left-hand portion of the image misaligned with the right-hand portion. Click anywhere in the X Overlap box under "2-3." The crosshairs cursor will appear. First click a position on the left-hand portion, then click the position of the right-hand portion that corresponds to the position you selected first.

(3) Click the "Check" button first, then click the "Set" button. Follow the on-screen instruction to place the test chart on the scanner again.

(4) Repeat these steps until the left-hand portion is properly aligned with the right-hand portion.
In this task, you need to adjust the X overlap and Y offset at the same time.
See "Tips for Making Fine Adjustments" on the next page if you encounter difficulties making fine adjustments.

(5) Similarly, make adjustments for 3-4, 1-2, and 4-5 in this order.
After finishing, close all adjustment menu windows. Use an A0 size document to perform normal scan, and confirm that the image appears properly.

Image after adjustments



CHECKPOINT

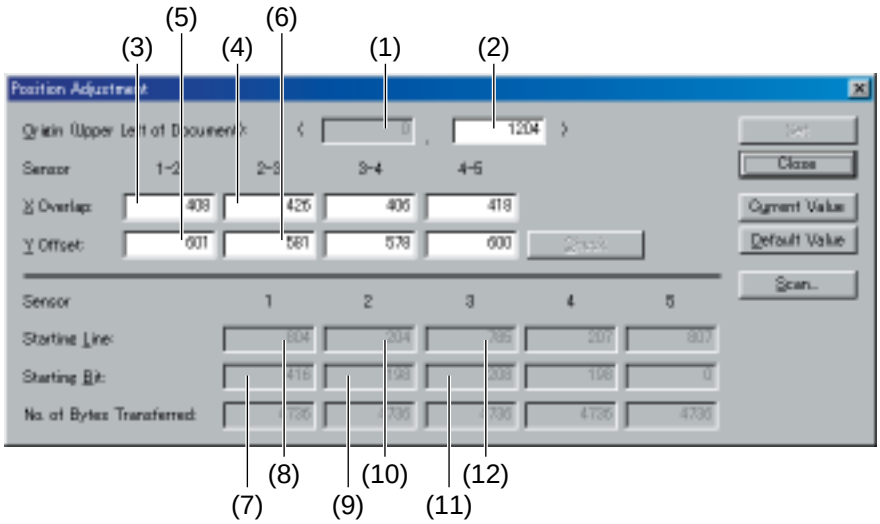
After completing adjustments, reset DIP switch "2" to the OFF position.

Tips for Making Fine Adjustments

- Two portions of the aligned image become misaligned during adjustments using the crosshairs cursor.
- You wish to move a portion of the image by one pixel.
- You find it difficult to find whether any portions of the image are misaligned.
- You feel that some portions of the image remain misaligned, despite efforts to correct the alignment.

In these cases, simply type in numbers to make adjustments.
In this section, we will give you a rough idea of what the numbers in the dialog box mean.
Once you become familiar with the meanings of these numbers and know which numbers to type in, you can make adjustments more accurately and quickly than by using the crosshairs cursor.

Description of the Dialog Box



(1) (2): Origin (Upper left corner of the document)
The upper left corner of the scanner image currently being displayed is always set to (0, 0).
The coordinates increase as you move across and down from this point.

(3) (4): X Overlap
These boxes show the numbers of pixels by which sensor 1 and 2 (2 and 3, 3 and 4, 4 and 5) images overlap. For more overlap, increase these numbers. Reduce these numbers if some portions of images are missing due to excessive overlap to enable accurate fine adjustments.

<<Handy Tip>> Theoretically, distance accuracy in the direction of sensors (in the X direction) cannot be corrected, since it is determined based on the calibration and quality of the individual sensors. However, using the overlaps will make the image appear to be corrected.
In general, use the size change function of the application software to make this adjustment. If your customer requests extreme accuracy and if the size change function does not produce satisfactory results, you may resort to this technique.
In contrast, if the overlaps are not properly adjusted, the product specifications may not be satisfied. Check these values if you receive complaints regarding accuracy in the X direction.

(5) (6): Y Offset

Sensors 1, 3, and 5 are attached 24.5 mm behind sensors 2 and 4 in the direction of the feed.
For this reason, there is always a 24.5 mm difference in the level of the scanned image.
Thus, 24.5 mm/0.0423 mm (1 pixel) = 579 (approx.) appears in these boxes.
In practice, values slightly greater or smaller than the above number will appear due to variations in sensor position and feed.
Keep in mind that with larger values, sensor 1, 3 and 5 images will move farther up.

<<Handy Tip>> Basically, the physical positions of sensors remain unchanged, and sensors are mounted with high accuracy. Therefore, if you find that a Y offset is significantly different from "579", you may conclude that feed accuracy requires adjustment.
Conversely, if you know that the feed accuracy is correct, you may conclude that the sensor's physical position is incorrect.
You can use the correction value "579" to adjust the feed so that there is no misalignment in the Y direction. This makes it possible to determine the feed, although this is not completely accurate. You may use this technique for users who do not demand high accuracy.

(7) (9) (11): Starting Line

The distances (numbers of pixels) from the document sensor to each of the image sensors in the direction of document feed are displayed in these boxes.
Subtracting value (9) from values (7) and (11) produces values (5) and (6), respectively.
If you change values (5) and (6) and press the "Check" button, values (9) and (11) will be calculated and changed automatically.

(8) (10) (12): Starting Bit

The image sensors themselves scan areas narrower than the area that can be physically scanned in order to provide a correction range.
The numbers in these boxes represent the numbers of dots from the positions at which the sensors can start their scan to those where the sensors actually start the scan.

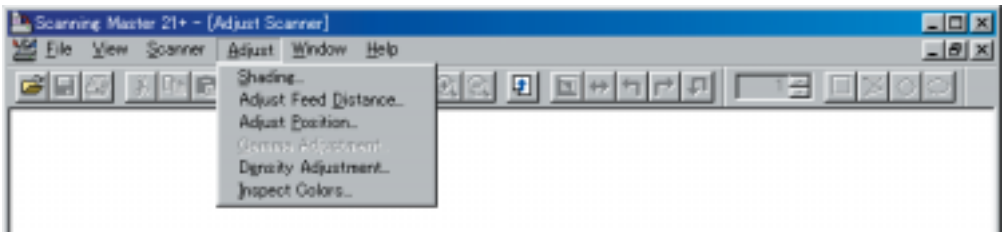
4. Shading (undesired color line removal)

- This adjustment removes white or color undesired lines caused by dirt after performing shading (white correction).
- Set DIP switch 2 on the scanner to "ON".
- Prepare two undesired color line removal check papers (gray and beige/white).

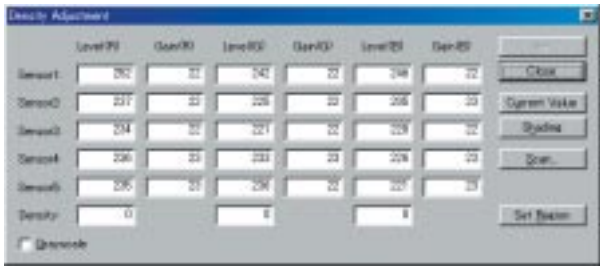
(1) Clean the scanner glass, document table, and document hold-down unit. Start the software and open the "Adjust Scanner" window.

(2) Place the beige/white paper in the center of the document table.

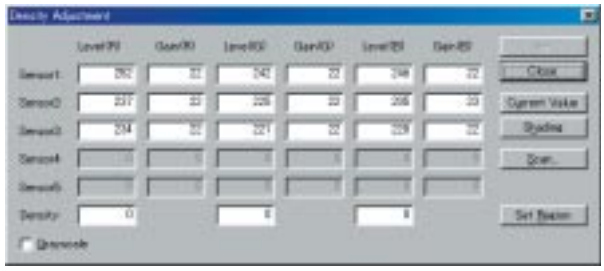
(3) Select "Density Adjustment" from the "Adjust" menu.



(4) The following dialog box will appear: Click the "Grayscale" check box to remove the check mark.

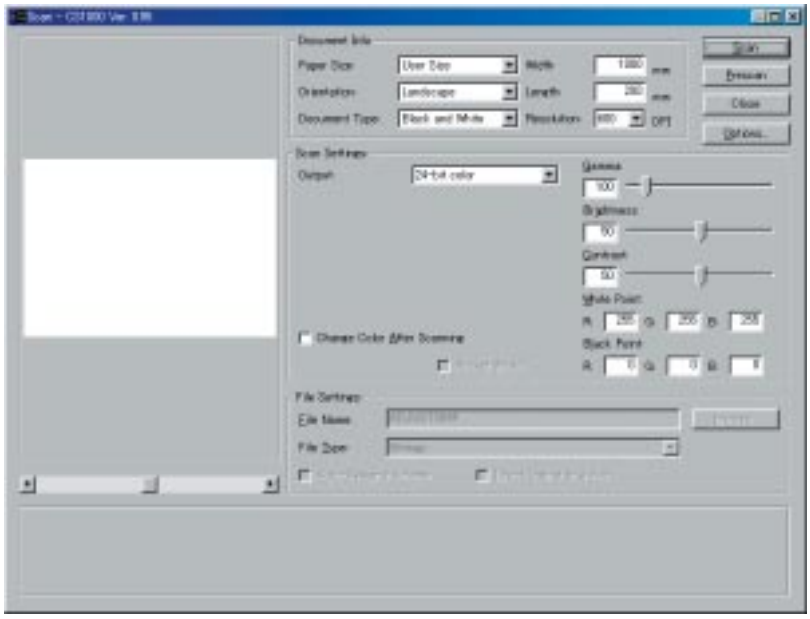


CS1000/1000EV



CS1100EV

(5) Click the "Scan" button. The following dialog box will appear.



Select the following for "Document Info" and "Scan Settings":

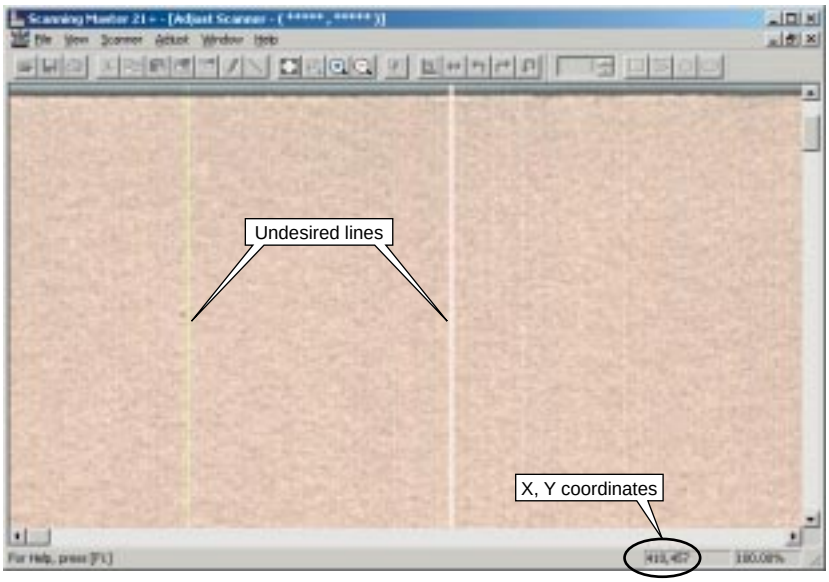
"Document Info" Document Type: Black and White, Paper Size: User Size,
Width: 1000 mm (CS1100: 630 mm), Length: 200 mm, Resolution: 600 dpi

"Scan Settings" Output: 24-bit color, Gamma: 100, Brightness: 50, Contrast: 50

(6) Check the scanned results for the presence of undesired lines. If undesired lines are present, identify the sensor number corresponding to the undesired line positions using the X coordinates. Moving the mouse cursor over the undesired lines on the screen displays their X and Y coordinates at the bottom right of the screen.

Table: X coordinate range scanned by each sensor

	Sensor No.	1	2	3	4	5
CS1000	X coordinates	0 to4704	4704 to 9440	9440 to 14176	14176 to 18912	18912 to 23616
CS1100	Y coordinates	0 to4960	4960 to 9950	9950 to 1478	—	—



CHECKPOINT

Undesired lines should be identified by separating the R, G, and B values using Photoshop "Histogram" for undesired lines of more than two pixels identified visually and confirming that all the R, G, and B values are less than 250. If any of the R, G, and B values are 250 or more, repeat the process from step (6). This can be checked using ScanningMaster ProColor if Photoshop is not installed.

CHECKPOINT

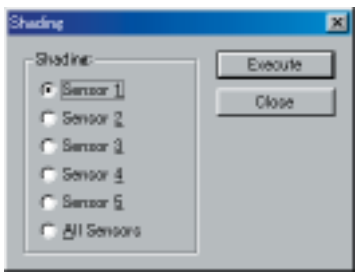
If there are no undesired lines, check using the gray paper. If no undesired lines are detected using the gray paper, follow the procedure in 5. "Shading (undesired gray line removal)" (Page 11-15).
The sensors are numbered from 1 on the left-hand side of the screen to 5 on the right-hand side.

(7) Note down the X coordinates of the undesired lines on the image scanned.

(8) Eject the undesired color line removal check paper. Clean the scanner glass and place the shading paper on the scanner.

(9) Identify the sensor number corresponding to the undesired line positions using the X coordinates and perform individual shading for that particular sensor.

(10) Select "Shading" on the screen, click the appropriate sensor number, and then select "Run".



(11) Once shading is finished, replace the shading paper with the undesired color line removal check paper and check that the undesired lines have disappeared. If they are no longer present, remove the undesired lines for the other sensors in the same way. The process is complete once the undesired lines for all sensors have been removed.

(12) If undesired lines are still present, repeat the process from step (6).

(13) Replace with the gray paper and adjust undesired line removal in the same way.

CHECKPOINT

If undesired white lines persist at the same positions even after repeating the undesired line removal procedure several times, it is possible that the glass is scratched or there is dirt inside the sensor unit (e.g., Selfoc lens upper section). Check accordingly.

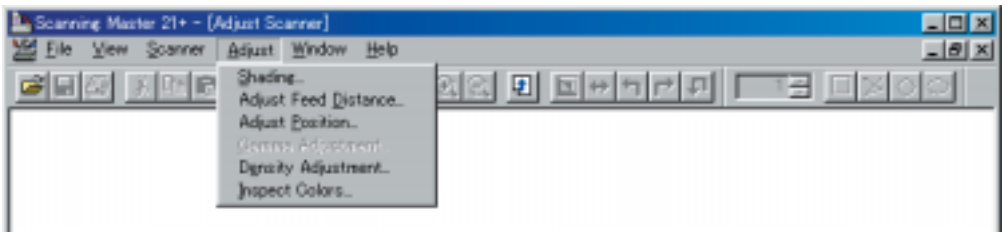
5. Shading (undesired gray line removal)

• This adjustment removes black or gray undesired lines caused by dirt after performing shading (white correction).
• Set DIP switch 2 on the scanner to "ON".
• Prepare four sheets of facsimile test chart No. 3.

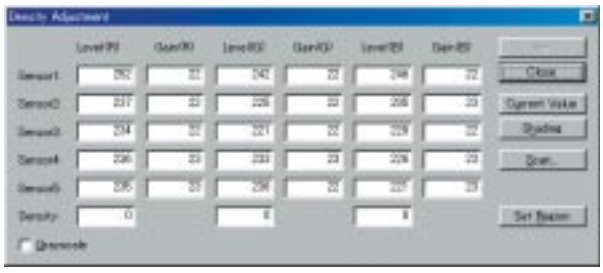
(1) Clean the scanner glass, document table, and document hold-down unit. Start the software and open the "Adjust Scanner" window.

(2) Place the four facsimile test chart No. 3 sheets on the scanner with no gaps between them. (Use two sheets for CS1100.)

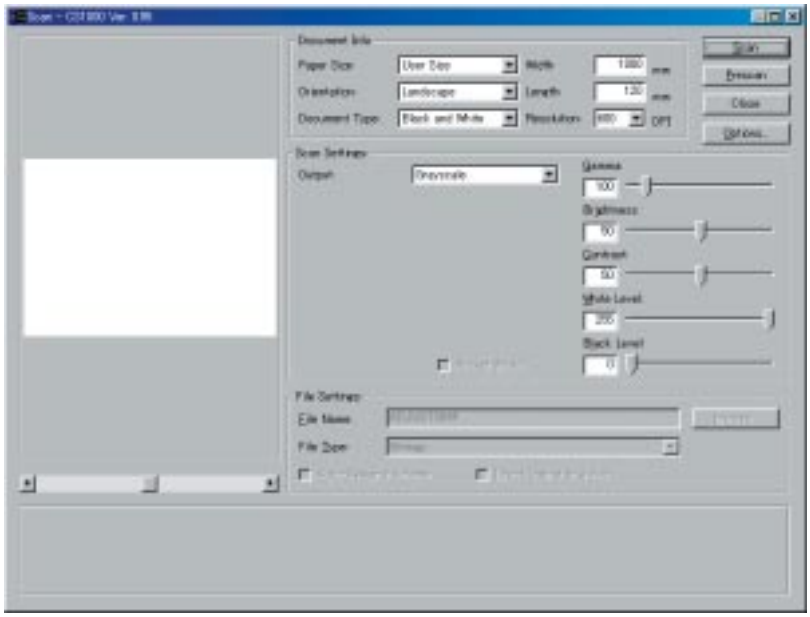
(3) Select "Density Adjustment" from the "Adjust" menu.



(4) The following dialog box will appear. Click to check the "Grayscale" check box.



(5) Click the "Scan" button. The following dialog box will appear.



Select the following for "Document Info" and "Scan Settings":

"Document Info" Document Type: Black and White, Paper Size: User Size,
Width: 1000 mm (CS1100: 630 mm), Length: 120 mm, Resolution: 600 dpi

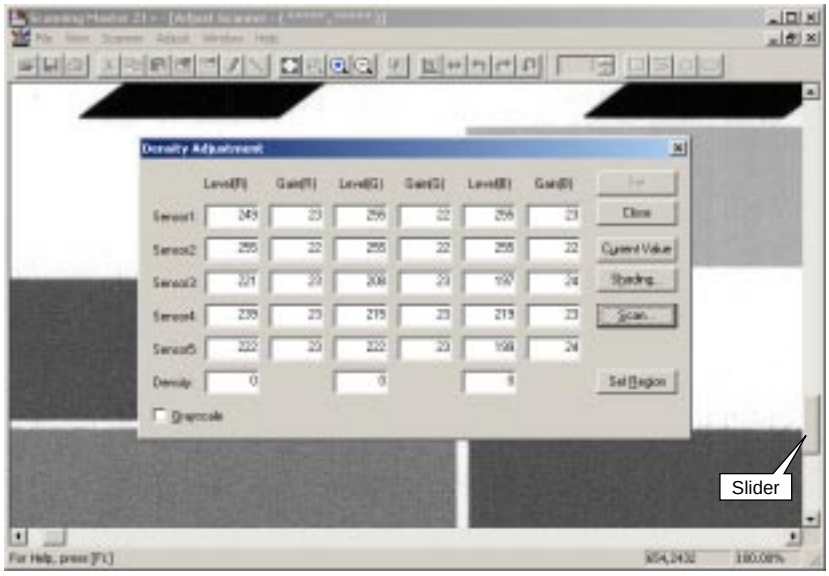
"Scan Settings" Output: Grayscale, Gamma: 100, Brightness: 50, Contrast: 50

(6) Click "Scan".

(7) Check the scanned results for the presence of undesired lines. If undesired black lines are present, check which sensor they correspond to. For the CS1100, reposition the sheets over sensors 2 and 3 and check them after checking sensors 1 and 2.

Table: X coordinate range scanned by each sensor

	Sensor No.	1	2	3	4	5
CS1000	X coordinates	0 to4704	4704 to 9440	9440 to 14176	14176 to 18912	18912 to 23616
CS1100	Y coordinates	0 to4960	4960 to 9950	9950 to 1478	—	—



CHECKPOINT

Check for undesired lines in the tile pattern area of the facsimile test charts. Move the slider on the screen up and down to check that there are no undesired lines for the five tile pattern colors.
The sensors are numbered from 1 on the left-hand side of the screen to 5 on the right-hand side.
Undesired lines should be identified by visually identifying undesired lines of one or more pixels and then checking that the differences in values with adjacent pixels are less than 8 when analyzed using Photoshop "Histogram". If the value of any of the differences is 8 or more, repeat the process from step

(8) These values can be checked using ScanningMaster ProColor if Photoshop is not installed.
Select "Shading" in the same way as for undesired color line removal, and perform individual shading for sensors affected by undesired lines.

(9) Continue adjusting until there are no longer any undesired black lines at any of the sensors.

(10) Set all the DIP switches on the scanner to "OFF".

CHECKPOINT

If undesired black lines persist at the same positions even after repeating the undesired line removal procedure several times, it is possible that the glass is scratched or there is dirt inside the sensor unit (e.g., Selfoc lens upper section). Check accordingly.
If the shading paper is scratched or dirty, replace it with a new paper.
The shading paper must always be set with the glossy side face up.

10.5 Resolution adjustment check

Check the resolution and accuracy for the CS1000 or CS1100.

1. Paper-feed distance accuracy check

Use the adjustment test chart to confirm that distances measured on the scanned image are within ±0.05%.

- Scan Settings
  Document Info: Paper Size: A0 (CS1100: A1), Resolution: 600 dpi
  Scan Settings: Output: Bilevel

2. Image-sensor offset (joint accuracy)

Check that this is ±1 dot at the four joins between the images scanned (two joins for CS1100) for both primary and secondary scanning.

- Scan Settings
  Document Info: CS1000: Paper Size: User Size, Width: 1000 mm, Length: 200 mm, Resolution: 600 dpi
  CS1000: Paper Size: User Size, Width: 630 mm, Length: 200 mm, Resolution: 600 dpi
  Scan Settings: Output: Bilevel

3. Offset check

Use the adjustment test chart to confirm that the left-hand solid rectangular scanning start mark is within 6 to 11 dots from the top of the scanning window.

- Scan Settings
  Document Info: CS1000: Paper Size: User Size, Width: 1000 mm, Length: 200 mm, Resolution: 600 dpi
  CS1000: Paper Size: User Size, Width: 630 mm, Length: 200 mm, Resolution: 600 dpi
  Scan Settings: Output: Bilevel

4. Resolution check

Check the resolution using the MTF adjustment test chart.

- Start up OPS112.
- Open the scanning window, set the scanning conditions specified below, and start scanning.
- Confirm that the resolution (six line pairs) can be determined.
- Scan Settings
  Document Info: CS1000: Paper Size: User Size, Width: 1000 mm, Length: 200 mm, Resolution: 600 dpi
  CS1000: Paper Size: User Size, Width: 630 mm, Length: 200 mm, Resolution: 600 dpi
  Scan Settings: Output: Bilevel monochrome, Intensity: 195,
  Intensity correction: 1, Edge Adjustment: 1

⚠CAUTION

The color intensities between the sensors must be virtually identical for the resolution pattern.
If the resolution pattern includes solid-colored sections (black or white), adjust the Intensity and confirm that the sections are resolved (solid sections are reduced and appear as vertical stripes).

5. Checking sensor color density (using a color test chart)

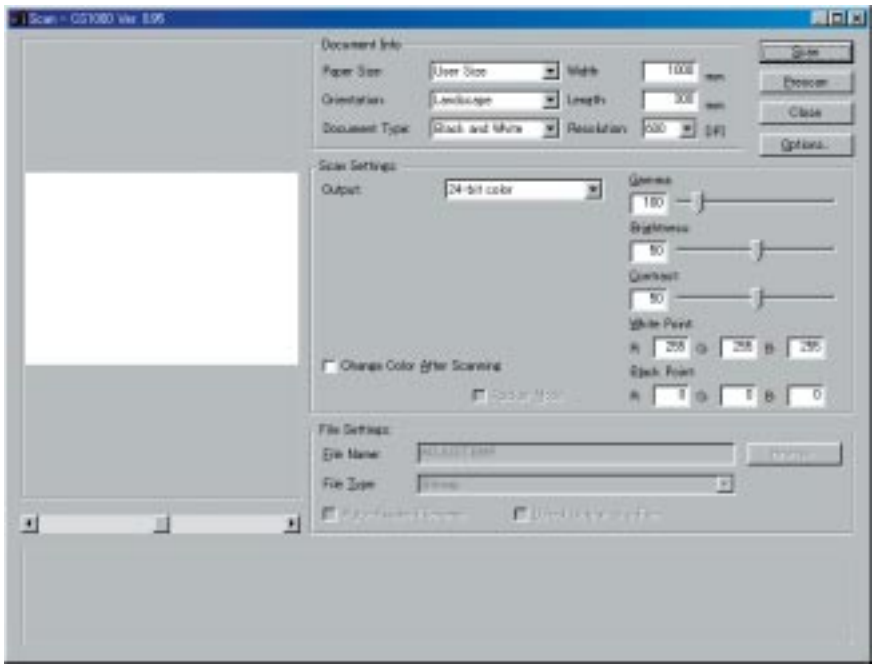
• This checks that the color differences for sensors and between the sensors are within the standard range.
• Prepare a color test chart and a red test chart.
• Set DIP switch 2 on the scanner to "ON".

(1) Clean the scanner glass, document table, and document hold-down unit. Start the software and open the "Adjust Scanner" window.

(2) Place the color test chart in the center of the document table. Insert the color test chart from the red tile end and scan, aligning it with the left and right-hand 1000 mm marks (630 mm for CS1100).

(3) Select "Inspect Colors" from the "Adjust" menu.

(4) Click the "Scan" button, set the scan settings in the scan window, and then click "Scan".

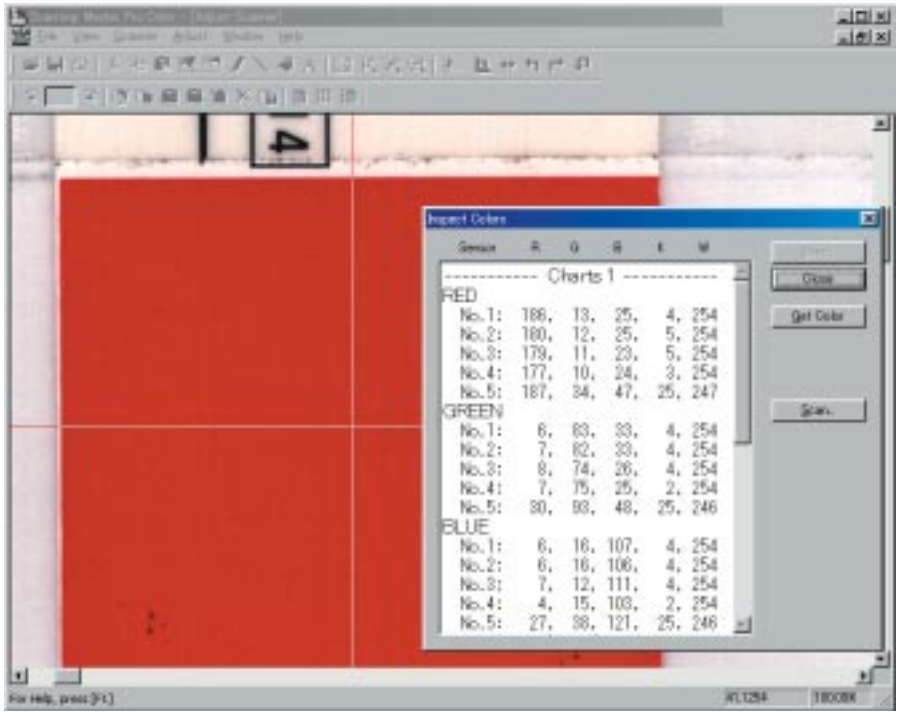


Select the following for "Document Info" and "Scan Settings":

"Document Info" Document Type: Black and White, Paper Size: User Size,
Width: 1000 mm (CS1100: 630 mm), Length: 300 mm, Resolution: 600 dpi

"Scan Settings" Output: 24-bit color, Gamma: 100, Brightness: 50, Contrast: 50

(5) Make sure that the red tile for sensor 1 (furthest left on screen) is displayed on the screen.
Pressing "Get Color" displays a crosshairs cursor. Move the crosshairs cursor to the center of the red tile.



(6) Click "Save" and select the save location. The following window appears when the data saved correctly.

(7) Start Microsoft Excel and open the file "Color difference measurement sample.xls." When the macro dialog box appears, click "Enable macro." Press the "Load data" button. Select the previously saved "xxx.csv" file. (For CS1100, open "Color difference measurement sample CS11.xls").

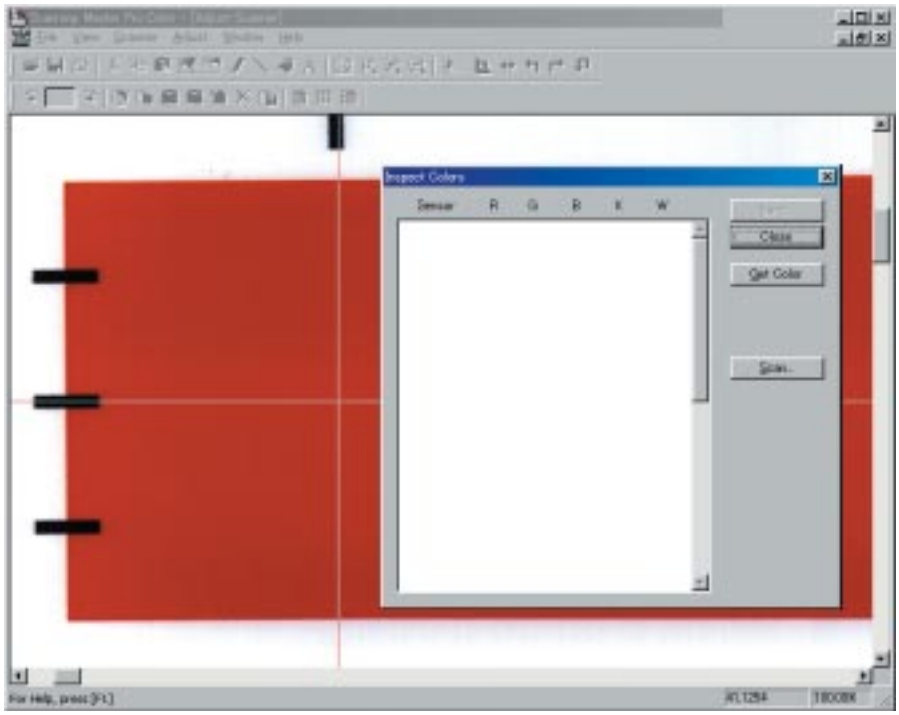
(8) Use the assessment criteria chart of the "Color difference measurement chart" to check that the color differences are within the standard ranges.
Standards
Color discrepancy within the same sensor: 8 or less
Color discrepancy within the same color: Red, green, blue; 20 or less, White, black; 8 or less
Color discrepancy between the same color sensors: 20 or less

(9) If the color differences for the red tile do not conform, the red tile can be checked individually.

(10) Place the red test chart in the center of the document table and select "Inspect Colors" from the "Adjust" menu.

(11) Click the "Scan" button, set the scan settings in the scan window, and then click "Scan".

(12) Make sure that the red band pattern is displayed on the screen. Pressing "Get Color" displays a crosshairs cursor. Click the crosshairs cursor at the position shown in the diagram below.



The diagram on the left shows the point for clicking the crosshairs cursor reduced in size. The screen display is 1:1 for "Get Color" when adjusting, so the screen will be enlarged.

(13) Click "Save" and select the save location. Start Microsoft Excel and open the file "Color difference measurement sample.xls". Press the "Load data" button. Use the assessment criteria chart of "Color difference measurement chart" to check that the color differences are within the standard ranges.

10.6 Color difference measurement chart

(1) Start Microsoft Excel and open the file "Color difference measurement sample.xls." (For CS1100, open "Color difference measurement sample CS11.xls".)

	A	B	C	D	E	F	G	H	I
1	Color Discrepancy Measurement Chart								
2						Load data			
3	Load the data in Charts 1 and 2.								
4	Chart direction 1: Direction in which the target color block is located to the right, when viewed on the screen								
5	Chart direction 2: Direction in which the target color block is located to the left, when viewed on the screen								
6									
7	Chart 1								
8									
9	Color separation	Sensor No.	RED	GREEN	BLUE	BLACK	WHITE		
10	RED	1	173	15	27	7	254		
11		2	176	14	27	7	254		
12		3	171	14	26	8	253		
13		4	177	15	28	7	254		
14		5	175	12	25	4	254		
15	GREEN	1	12	80	28	7	254		
16		2	10	76	28	7	254		
17		3	11	74	26	6	254		
18		4	11	75	27	6	254		
19		5	9	74	26	5	254		
20	BLUE	1	10	17	107	7	254		
21		2	8	17	104	6	254		
22		3	9	14	109	6	254		
23		4	8	17	107	6	254		
24		5	7	16	103	5	254		
25									
26									
27	Chart 2								
28									
29	Color separation	Sensor No.	RED	GREEN	BLUE	BLACK	WHITE		
30	RED	1	167	13	26	8	251		
31		2	175	13	26	7	254		
32		3	160	12	24	6	249		

(2) Check that the color differences are within the standard ranges. Remeasure them if they do not conform. If the color differences do not conform after measuring two or three times, perform shading (white correction). In this case, color and gray undesired line removal must both be repeated as well.

⚠CAUTION

The color test chart is expensive. Take care not to scratch it or allow it to become dirty.
The results may not conform if the color test chart is scratched or dirty, or if the sheet is warped or set at an angle.

11. TROUBLESHOOTING

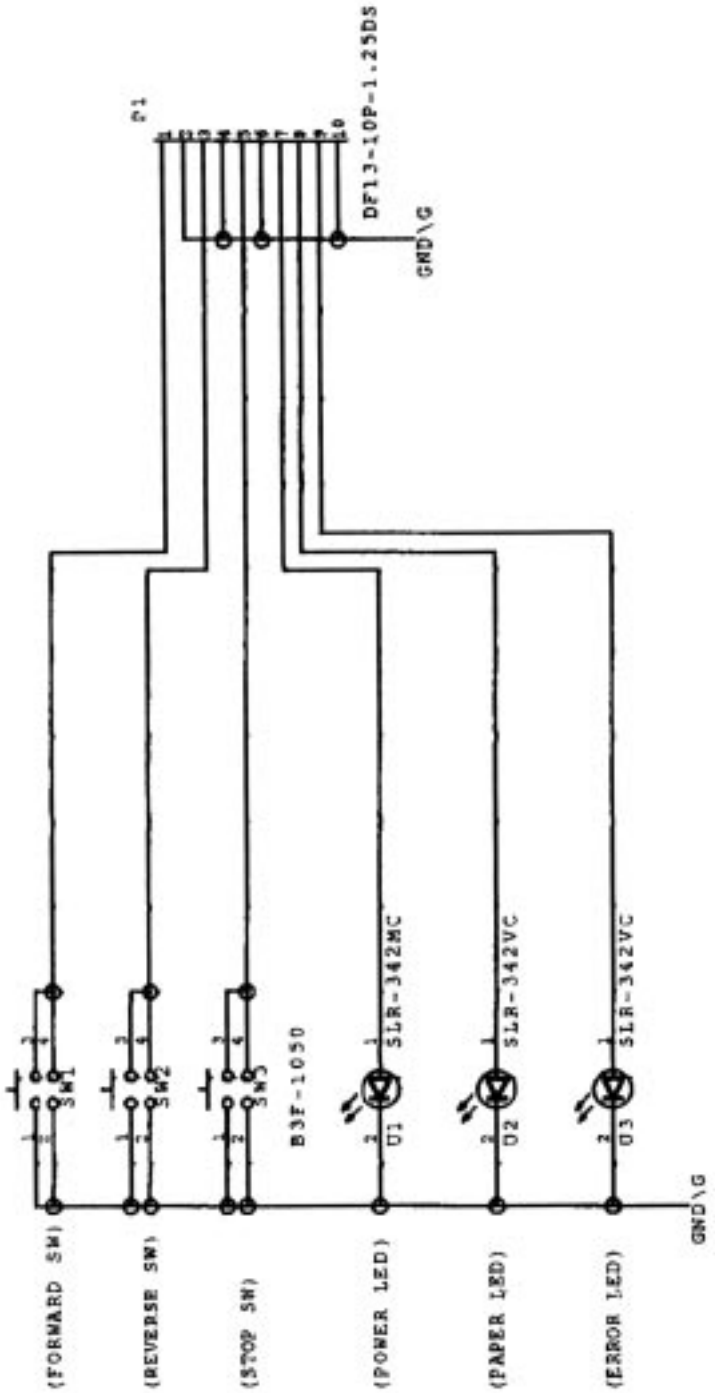
Cause	Checkpoint	Remedy
Lamps on the control panel remain unlit.	Confirm that the power switch has been switched on.	Switch on the power switch.
	Confirm that the power cable is properly connected.	Connect the cable properly.
	Confirm that the cable is properly connected to the control device.	Connect the cable properly.
	Confirm that the power outputs (+24 V, +5 V, +3.3 V) are appropriate.	Check the power supplies and replace if necessary.
	Other	Replace the control boards. Replace the main control board.
The document is not scanned, although it is moved to the scanning position.	Confirm that the PAPER LED is lit.	Check the document detection photosensor.
	Confirm that the SCSI cable is properly connected.	Connect the cable properly.
	Confirm that the appropriate SCSI-ID has been specified.	Set SCSI ID switches properly.
	Confirm that the parameters on the SCSI host side are set properly.	Specify the appropriate parameters.
	Confirm that the SCSI cable is properly connected within the scanner.	Connect the cable properly.
	Confirm that the appropriate model has been specified.	Use Scanning Master 21+ to specify the correct scanner model.
	Other	Replace the main control board.
The document is not transported properly.	Check for foreign objects in the document scanning section.	Detach the document hold-down unit and remove foreign objects.
	Confirm that the roller rotates when you press a control key.	Check for anomalies around the control boards.
	Confirm that the feed motor is running.	Check for anomalies around the motor.
	Confirm that +24 V is output.	Check the power supply and replace if necessary.
	Other	Replace the control boards.
		Replace the main control board.
The document is not automatically rewound when the scan is complete.	Confirm that "Front" is selected for "Paper Control" in Scanning Master 21+.	Select "Front" for "Auto Eject."
	Confirm that the document is properly fed back.	Check for anomalies around the paper feed section and the motor.
The scanned data is completely black.	Confirm that an appropriate white correction value has been specified.	Perform shading (white correction).
	Confirm that the image sensor cables are properly connected.	Confirm that the image sensor cables are properly connected, with no broken wires.
	Confirm that the image sensor LEDs are lit.	Check the +5 V power supply and replace it if it is faulty. Replace the main control board. Replace the image sensors.
	Confirm that an appropriate value is specified for "Intensity (Brightness)" in the Scanning Master 21+.	Adjust "Intensity (Brightness)" in Scanning Master 21+.

Cause	Checkpoint	Remedy
The scanned drawing has undesired black lines.	Check the scanning glass for dust and damage.	Clean the scanning glass and replace if necessary.
		Clean the image sensors.
	Confirm that shading (undesired line removal) has been properly performed.	Perform shading (undesired line removal) again. If the problem persists, repeat shading from the beginning (white correction).
	Check the document hold-down unit for stains.	Clean the document hold-down unit.
	Check whether the problem persists after cleaning and adjustments.	Replace the image sensors.
The scanned drawing has undesired white lines.	Check the scanning glass for dust and damage.	Clean the scanning glass and replace if necessary.
	Confirm that shading (undesired line removal) has been properly performed.	Perform shading (undesired line removal) again.
Part of the scanned drawing is missing (the scanned drawing is horizontally compressed).	Confirm that the sensor X overlaps and Y offsets are appropriate.	Align the sensor joints.
Part of the scanned drawing is overlapped.	Confirm that the sensor X overlaps and Y offsets are appropriate.	Align the sensor joints.
The image quality is poor.	Check whether the scanning glass is dirty.	Use purified water or alcohol to clean the scanning glass. (Do not use chemical solvents.)
	Confirm that the image resolution is appropriate.	Select an appropriate resolution.
The PC does not detect the scanner.	Confirm that the scanner has been turned on.	Turn on the scanner.
	Confirm that the PC has detected the SCSI card properly.	Reattach the SCSI card, set it up, and reinstall the SCSI driver.
	Check the cable for broken wires, shorting, and bent connector pins.	Replace the cable.
	Confirm that the cable is 3 m or shorter.	Change the cable length.
	Confirm that the daisy-chain settings are appropriate.	Check whether the same SCSI ID has been assigned twice. Check the terminator settings.
	Confirm that the power supply for the scanner unit functions properly.	Check the supply voltage and replace the power supply as necessary.
	Confirm that the recommended SCSI card is used.	Correct scanner function cannot be assured unless the Adaptec SCSI card is used. Ultra2 or Ultra2W cannot be connected. Replace the SCSI card.
	Use a PC that correctly detects other scanners to determine whether the problem is with the PC itself.	Replace the main control board. (Reinstall the boot program.)

Cause	Checkpoint	Remedy
When placed on the scanner, the paper is moved beyond the scanning section and drops in the tray in the back of the scanner.	The paper sensor does not function properly.	Replace the paper sensor. Clean the paper sensor. Check the sensor cable for contact with other cables.
Paper jam occurs.	The clearance between the separator plate and sensor cover is not wide enough. (design clearance: 2 mm)	Check the clearance between the separator plate and the sensor cover.
	Check the transfer section for foreign objects.	Remove foreign objects.
	Check the glass base unit and sensor cover for clearance.	Adjust the glass base unit and sensor cover positions.
There is a difference in color density between the right- and left-hand portions of the document scanned with grayscale.	The sensor color density has not been properly corrected.	Adjust color density.
The scanner locks up during scanning.	Go over the checkpoints and remedies for "The PC does not detect the scanner."	
	The AHA-2940AU is used.	Check the transfer rate. Reduce "Maximum Sync Transfer Rate" from 20 Mbps down to 10 Mbps.
The scanned drawing is dark. (Gray/color)	Is the document hold-down unit properly in place?	Position the document hold-down unit securely.
When the scanner is connected under Windows NT 4.0 or Windows 2000, the ID number is recognized. However, an error message "SCSI adapter (or scanner) cannot be found" appears in the application and the scanner cannot be connected.	In Windows NT 4.0 or Windows 2000, you need a device driver (ASPI32) in addition to the SCSI driver. Install ASPI32. If the problem persists even after installing this driver, check the following: **<Windows NT 4.0>** "Start" and "System" may not be specified for the device driver ASPI32. Select [Control Panel] → [Devices] and specify "Start" for "Status" and "System" for "Startup." **<Windows 2000>** "Running (Start)" may not be specified for the device driver ASPI32. Select [Control Panel] → [Management Tools] → [Manage Computer] → [System Info] → [Software Config.] → [Drivers] and specify "Running" for "Running (Start)." You can start or stop the ASPI32 driver by typing the following commands at the command prompt: "Running (Start)" ... Type in "net start aspi32." "Stop" ... Type in "net stop aspi32."	
After connecting the scanner, "?" appears at "Other Devices" in the Device Manager. When you check its properties, you get the message: "This device does not function properly."	This message does not indicate a problem. You can continue to use the scanner.	When you install the Adaptec EZ-SCSI, [GRAPHTEC CS1000] appears.

12. SCHEMATIC DIAGRAMS

12.1 Control Board



13. OPTION

13.1 Basket Assembly Procedure (PG0010)

Parts List

(1) Basket mounting bar guides ..... x 2
(2) Basket mounting bar 1* ..... x 1
(3) Basket mounting bar 2* ..... x 1
(4) Basket sheet* ..... x 1
(5) M4 x 6 binding head screws (6-mm length) ..... x 4
(6) Decorative screws ..... x 2
(7) M4 x 20 binding head screws (20-mm length) ... x 2
(8) Phillips screwdriver ..... x 1

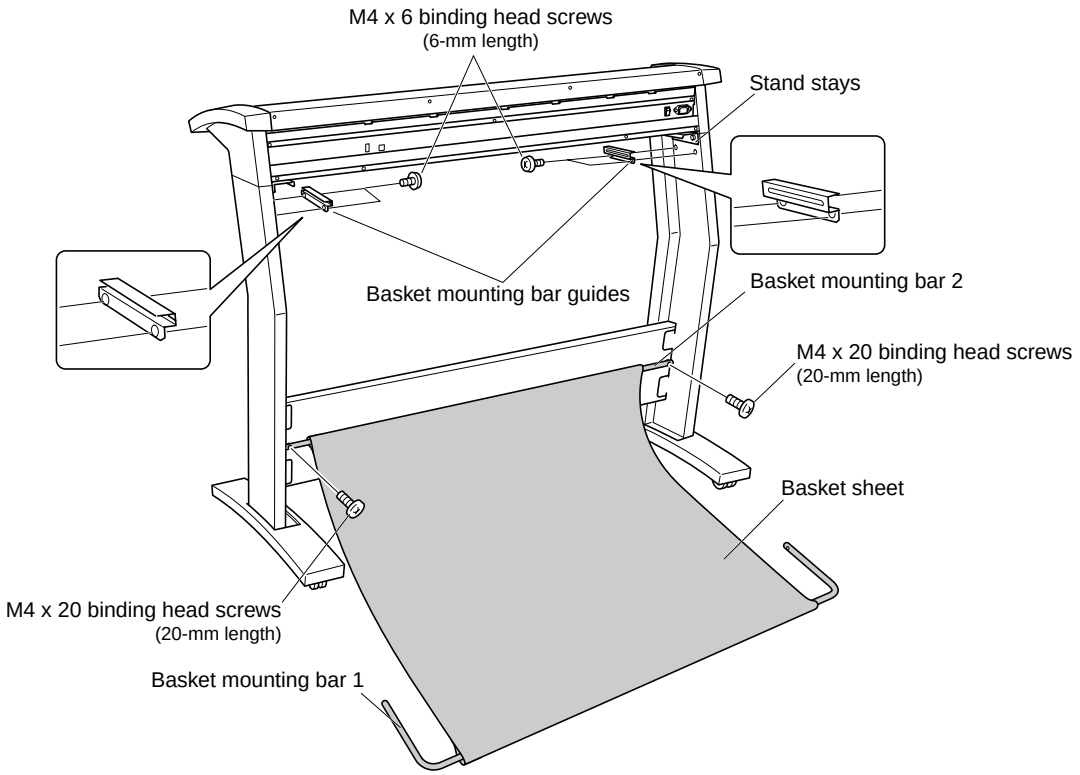
*The basket sheet comes already affixed to the two basket mounting bars.

Assembly Procedure

Step 1

(1) Attach the two basket mounting bar guides to the stand using the four M4 x 6 binding head screws,making sure that they do not ride above the stand stays.

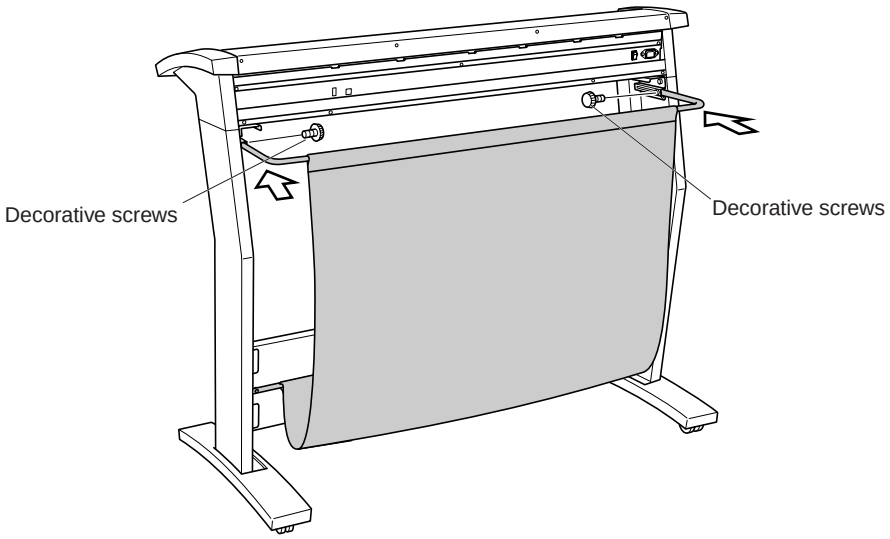
(2) With the basket sheet affixed to basket mounting bar 1 and basket mounting bar 2 ,attach basket mounting bar 2 to the stand's center bar, using the two M4 x 20 binding head screws.



Step 2

(1) Insert the ends of basket mounting bar 1 into the two basket mounting bar guides.

(2) With the bar ends fully inserted, insert the two decorative screws at the innermost end of the long screw hole on the basket mounting bar guides and tighten until the screws are fully inserted into the holes at both ends of basket mounting bar 1.



CHECKPOINT

If you are using the document support wires on the CS1000, pull out basket mounting bar 1 as required.

⚠CAUTION

To prevent damage to the basket or to the scanner itself, do not place any heavy objects in the basket or on the basket mounting bars. Do not allow documents to pile up in the basket, as they may become damaged.

14. PARTS LISTS

14.1 Parts List

No	Parts No.	Description	Part name	Q'ty	Remarks	
1	314690020	Bearing	6900ZZNXR	4		
2	324050511	Bearing	OILES 80F-0505	1		
3	324080311	Bearing	OILES 80F-0803	1		
4	341511001		O Ring 1AP12	264		
5	378019021	Drive Belt	Belt 60S2M380	1		
6	379000168		Coil Spring A085-02	22		
7	392330090		Spacer C-309	22		
8	392340090		Spacer C-409	44		
9	500050303	Inlet	FN9223-3106	1		
10	500050305	ID Switch	ID Switch	1		
11	500050731	Memory 128MB	D2V4A8D-CL2	1		
12	500050736	24V Switching Power Supply	LDA75F-24-H	1		
13	500050745	Motor	KT60LM06-551	1		
14	500050747	Connection Cable (CIS Board to Main Board)	8925E050179030GG	2		
15	500050803	3.3V Switching Power Supply	LDA15F-3-3.3	1		
16	500050804	5V Switching Power Supply	LDA15F-5	1		
17	500050807	Cooling Fan	TUDC24B4-500	1		
18	502112009	Power Switch	SW, AJ7201B	1		
19	502210002	Paper Sensor	PS-R50L-A	2		
20	640100533	A0 Carrier Sheet	IS10 Carrier Sheet	1		
21	640310090		P4 IS31 Pinch Roller Stay	22		
22	640310410		P4 IS31 Pinch Roller Shaft	22		
23	640310450	Document Support Wires	IS31 Document Support Wires	3		
24	640310510		P4 IS31 Pinch Roller G	44		
25	641000060		IMG Mounting Bracket A	2		
26	641000070		IMG Mounting Bracket B	2		
27	641000210		Handle-ring Socket	2		
28	641000221		CS Retaining Plate	1		
29	641000230		C-42-2 Handle-ring	2		
30	641000240	Drive Roller	CS Drive Roller	2		
31	641000300	Front Guide	CS Front Guide	1		
32	641000320	Left Side Cover	CS Side Cover Left	1		
33	641000330	Right Side Cover	CS Side Cover Right	1		
34	641000341	Top Cover	CS Top Cover	1		
35	641000430		Top Pin	1		
36	641000441		CSRP Mounting Bracket	2		
37	641000470	Spring	C-124G	4		
38	641000600	User's Manual (English)	CS1000-UM-151	1		
39	641000840	Control Panel	CS10 Control Panel	1		
40	693610011	Cable	IS2100C-1	1		

No	Parts No.	Description	Part name	Q'ty	Remarks	
41	693610021	SCSI I/F Cable	IS2100C-2A	1		
42	693610130	Connection Cable (Switch to Inlet) (White)	IS2100C-13	1		
43	693610140	Connection Cable (Switch to Inlet) (Black)	IS2100C-14	1		
44	694031080	FG (Inlet) Cable	IS3100C-8	1		
45	694440011	Rear Sensor Cable	CS1000C-1	1		
46	694440021	Front Sensor Cable	CS1000C-2	1		
47	694440032	Sensor Unit	CS1000C-3	1		
48	694440040	Control Panel Cable	CS1000C-4	1		
49	694440051	Connection Cable (Main Board to Motor)	CS1000C-5	1		
50	694440063	Connection Cable (Power Suuply to Main Board)	CS1000C-6	1		
51	694440074	Connection Cable (Switch to Power Suuply)	CS1000C-7	1		
52	774012500	Main Board	Main Board	1		
53	774012510	CIS Control Board A	CIS Control Board A	1		
54	774012520	CIS Control Board B	CIS Control Board B	1		
55	774012800		Image Sensor Unit (Maintenance)	1		
56	774012810	1 set (2 rollers)	Pinch Roller Unit (Maintenance)	2		
57	774012820		Glass Base Unit (Maintenance)	1		
58	794021091	Control Panel Board	IS21 Control Panel Board	1		
59	488000092	Jig	CS1000 Shading paper	1		
60	488000093	Jig	CS1000 adjustment test chart	1		
61	488000094	Jig 1 set (2 colors)	Color line removal check paper	2		
62	488000095	Jig	Facsimile test chart No.3	4		
63	488000096	Jig	MTF adjustment test chart	3		
64	488000097	Jig	Color test chart	1		
65	488000098	Jig	Facsimile test chart No.1	1		

14.2 External Casing 1

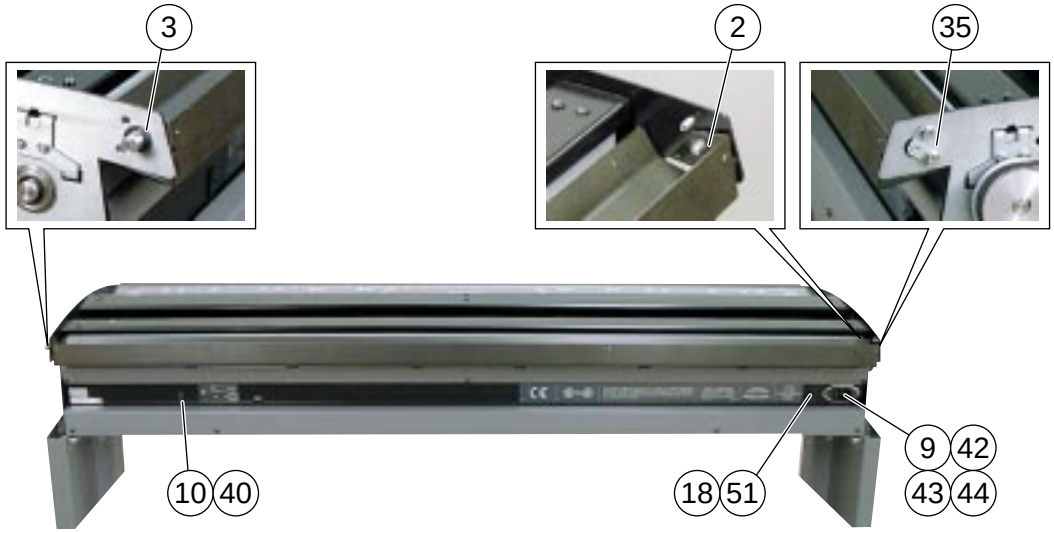
(31) 641000300 CS Front Guide x 1

(32) 641000320 CS Side Cover Left x 1

(33) 641000330 Side Cover Right x 1

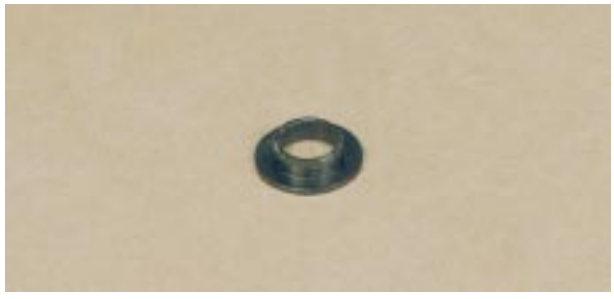
(34) 641000341 CS Top Cover x 1

14.3 External Casing 2



(2) 324050511 80F-0505 Bearing x 1

(3) 324080311 80F-0803 Bearing x 1



(9) 500050303 FN9223-3106 Inlet x 1

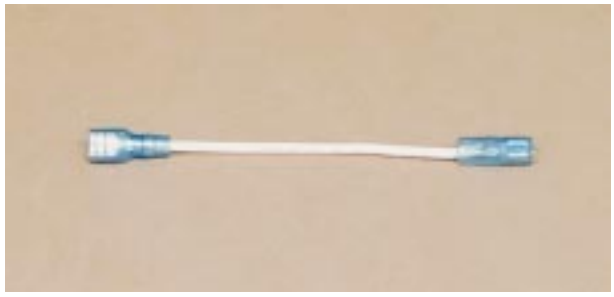
(10) 500050305 ID Switch x 1

(18) 502112009 SW, AJ7201B Power Switch x 1

(35) 641000430 Top Pin x 1

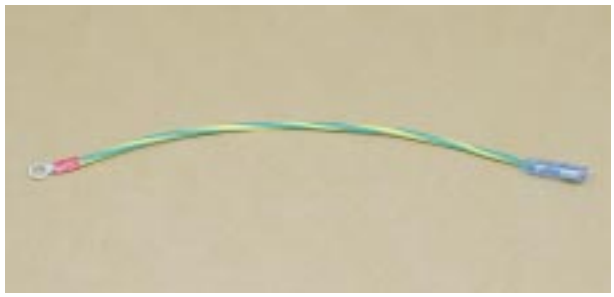
(40) 693610011 IS2100C-1 Cable x 1

(42) 693610130 IS2100C-13 Cable x 1

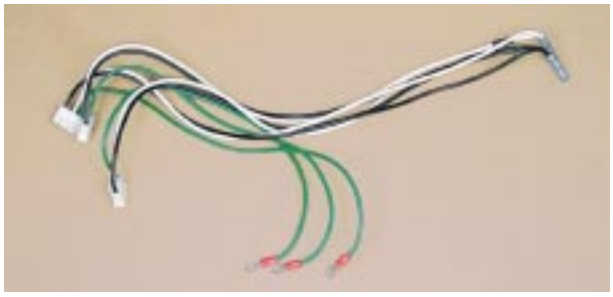


(43) 693610140 IS2100C-14 Cable x 1

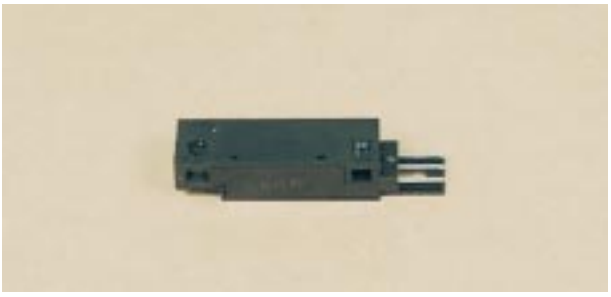
(44) 694031080 IS3100C-8 Cable x 1

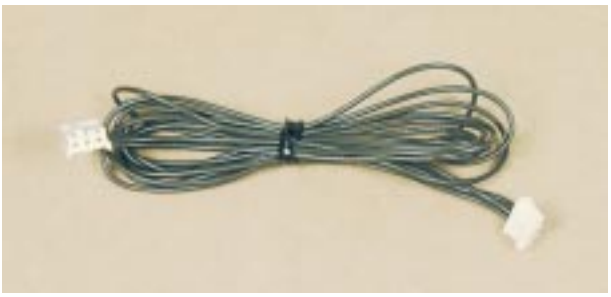


(51) 694440074 CS1000C-7 Cable x 1



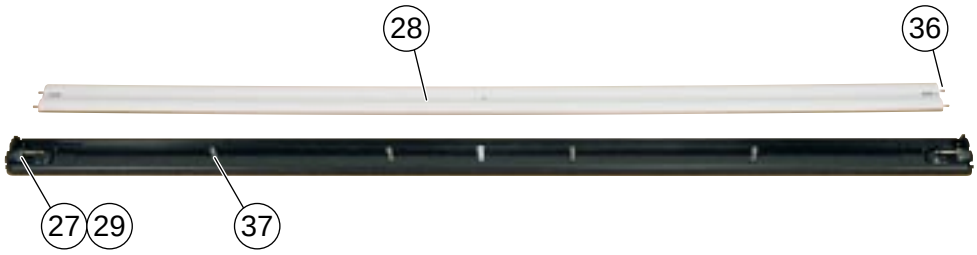
14.4 External Casing 3

(19) 502210002 PS-R50L-A Paper Sensor x 1	(39) 641000840 CS10 Control Panel x 1
	

(46) 694440021 CS1000C-2 Cable x 1	(47) 694440032 CS1000C-3 Sensor Unit x 1
	

(48) 694440040 CS1000C-4 Cable x 1	(58) 794021091 IS21 Control Panel Board x 1

14.5 Document Hold-down Unit



(27) 641000210 Handle-ring Socket x 2

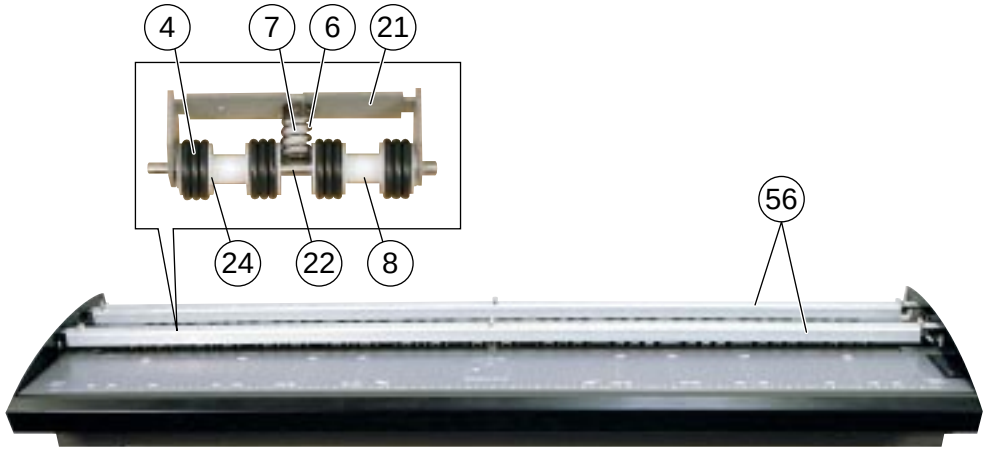
(28) 641000221 CS Retaining Plate x 1

(29) 641000230 C-42-2 Handle-ring x 2

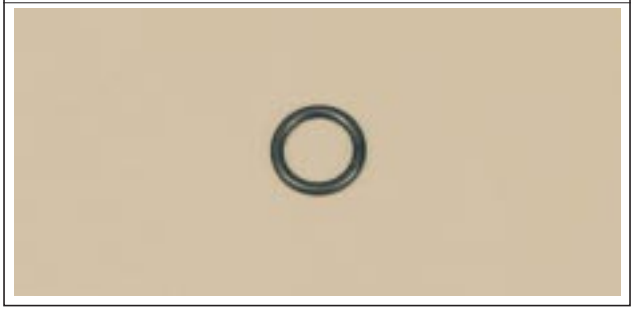
(36) 641000441 CSRP Mounting Bracket x 2

(37) 641000470 C-124G Spring x 4

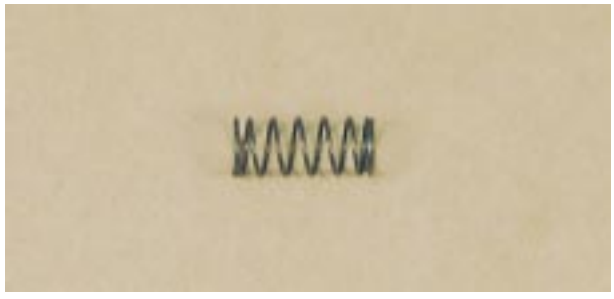
14.6 Pinch Roller Unit



(4) 341511001 O Ring 1AP12 x 264



(6) 379000168 Coil Spring A085-02 x 22

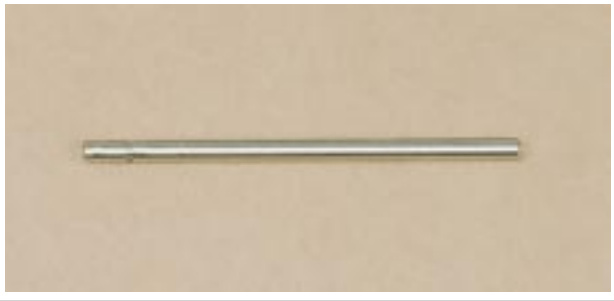


(7) 392330090 Spacer C-309 x 22

(8) 392340090 Spacer C-409 x 44

(21) 640310090 P4 IS31 Pinch Roller Stay x 22

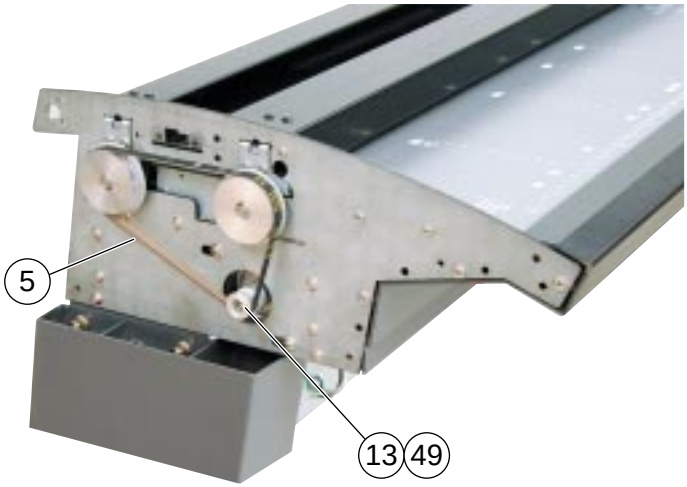
(22) 640310410 P4 IS31 Pinch Roller Shaft x 22



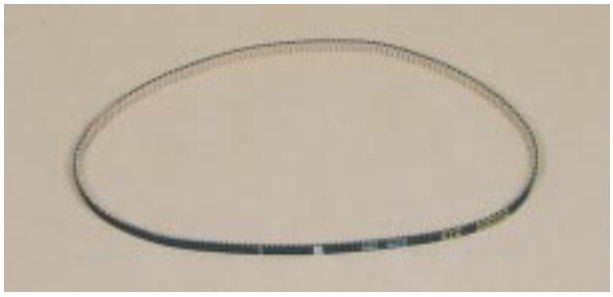
(24) 640310510 P4 IS31 Pinch Roller G x 44

(56) 774012810 Pinch Roller Unit (Maintenance) x 2

14.7 Drive Unit

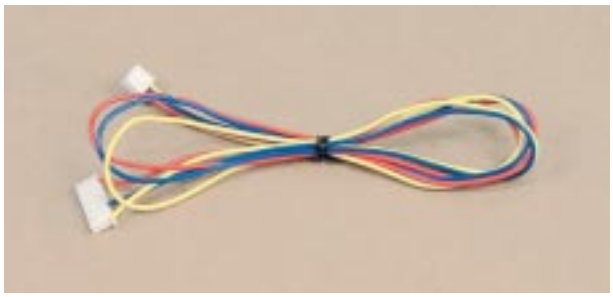


(5) 378019021 Belt 60S2M380 x 1

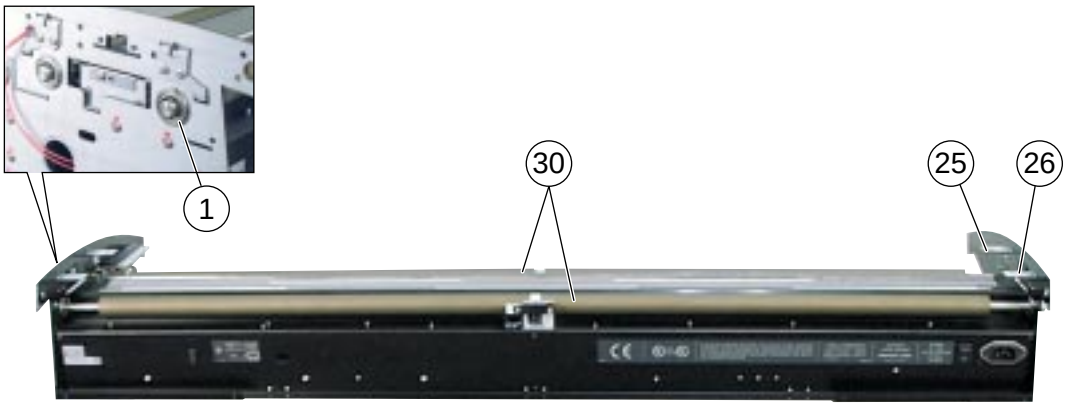


(13) 500050745 KT60LM06-551 Motor x 1

(49) 694440051 CS1000C-5 Cable x 1



14.8 Drive Roller Unit



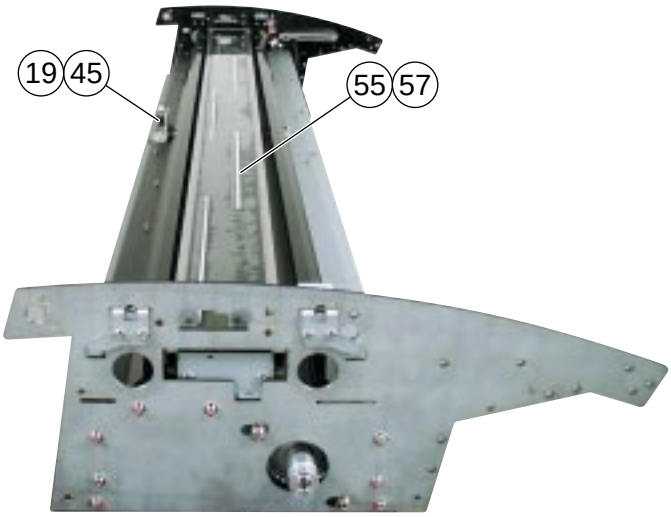
(1)	314690020	6900ZZNXR	Bearing	x 4

(25)	641000060	IMG Mounting Bracket A	x 2

(26)	641000070	IMG Mounting Bracket B	x 2

(30)	641000240	CS Drive Roller	x 2

14.9 Sensor Unit



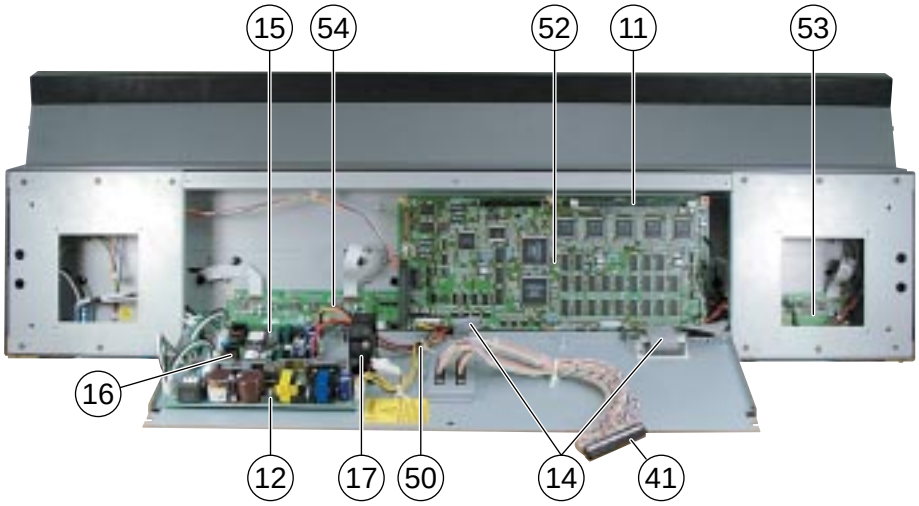
(19) 502210002 PS-R50L-A Paper Sensor x 1

(45) 694440011 CS1000C-1 Cable x 1

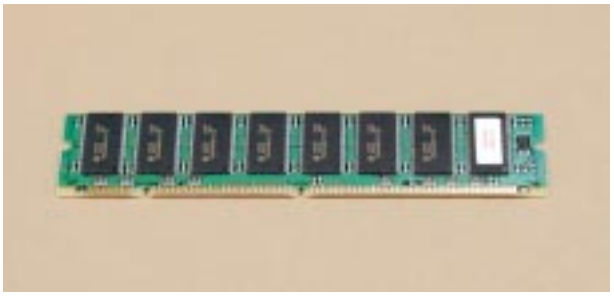
(55) 774012800 Image Sensor Unit (Maintenance) x 1

(57) 774012820 Glass Base Unit (Maintenance) x 1

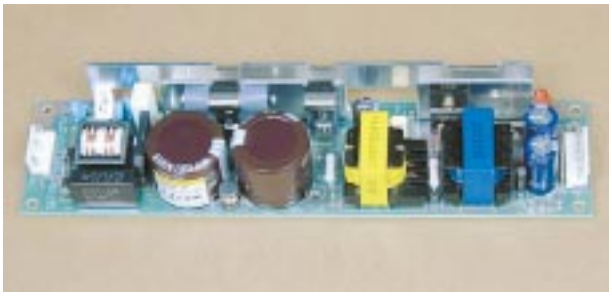
14.10 Board Unit



(11) 500050731 D2V4A8D-CL2 Memory x 1



(12) 500050736 LDA75F-24-H Power Supply x 1



(14) 500050747 8925E050179030GG Cable x 2

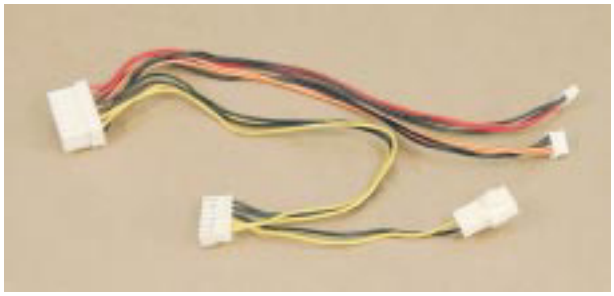
(15) 500050803 LDA15F-3-3.3 Power Supply x 1

(16) 500050804 LDA15F-5 Power Supply x 1

(17) 500050807 TUDC24B4-500 Fan x 1

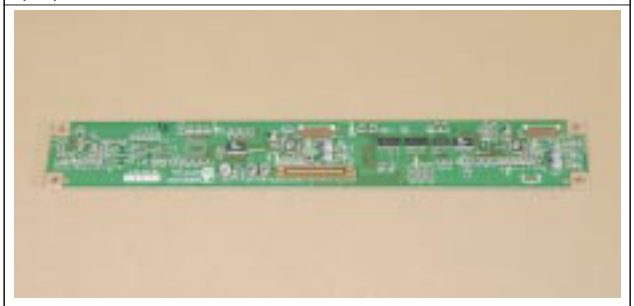
(41)	693610021	IS2100C-2A	SCSI I/F Cable	x 1

(50)	694440063	CS1000C-6	Cable	x 1
	694441060	CS1100C-6	Cable	x 1

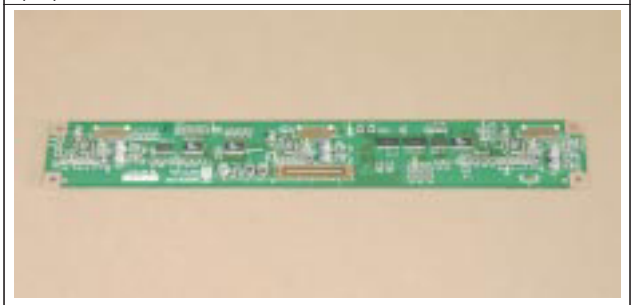


(52)	774012500	Main Board CS1000/CS1000EV	x 1
	774013500	Main Board CS1100EV	x 1

(53)	774012510	CIS Control Board A	x 1



(54)	774012520	CIS Control Board B	x 1



14.11 Accessories

(20) 640100533 IS10 Carrier Sheet x 1

(23) 640310450 IS31 Document Support Wires x 3

(38) 641000600 CS1000-UM-151 x 1

SC0006 SCSI Cable x 1

14.12 Accessory Changes from CS1000

Changed Accessory List

CS1000EV

- The CS1000EV uses the same electrical and mechanical units as the CS1000.
- New EV body labels are added.
- New document hold-down unit EV (high-pressure type for CS1000EV) is added.

No	Parts No.	Description	Part name	Q'ty	Remarks	
1	641000790	EV body label	EV body label	1		
2	774012830	Document hold-down unit	Hold-down unit maintenance	1	Standard	
3	774012840	Document hold-down unit EV	Hold-down unit EV maintenance	1	High-pressure	
4	641000660	Hold-down CS-JEC	Hold-down CS-JEC	1		
5	380101741		Pressure spring C-174	5		
6	641000672	Hook	Hold-down hook	2		

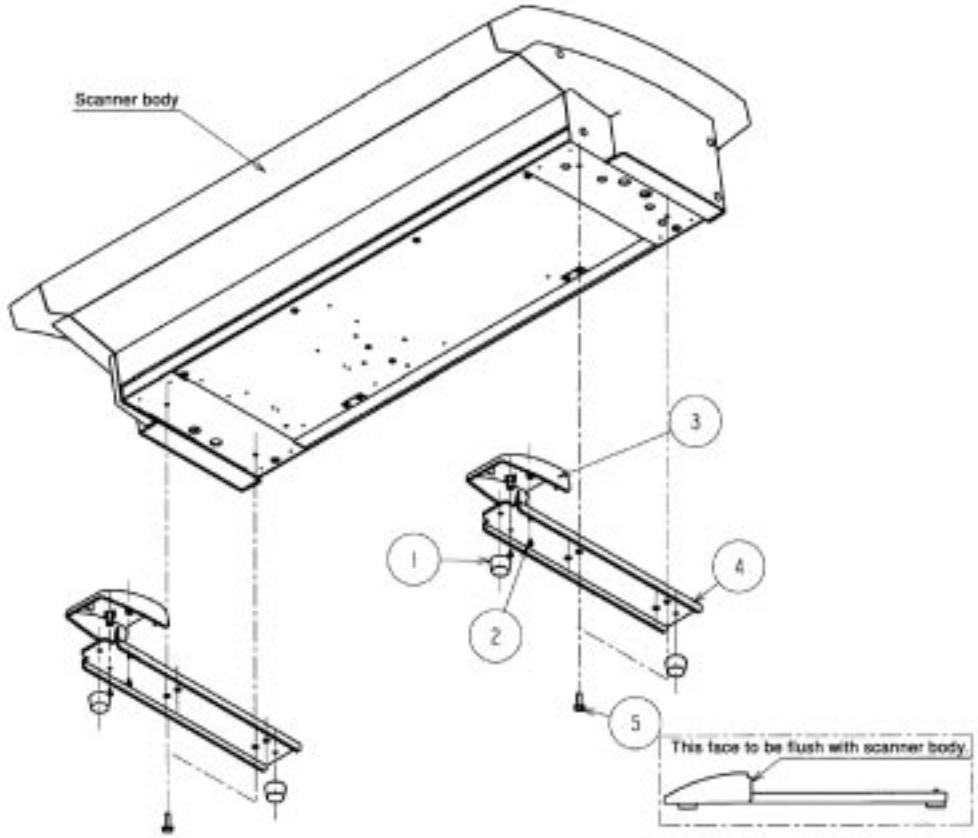
CS1100EV

No	Parts No.	Description	Part name	Q'ty	Remarks	
1	774013500	Main board	CS11 Main board	1		
2	774013800	Image sensor unit	CS11 Image sensor unit maintenance	1		
3	774013810	Pinch roller unit	CS11 Pinch roller unit maintenance	1		
4	774013820	Glass base unit	CS11 Glass base unit maintenance	1		
5	774013830	Document hold-down unit	CS11 Hold-down unit maintenance	1	Standard	
6	774013840	Document hold-down unit EV	Hold-down unit EV maintenance	1	High-pressure	
7	641110200	Hold-down CS	CS11 Hold-down CS	1		
8	694441010	For rear medium sensor	CS1100C-1	1		
9	694441020	For front medium sensor	CS1100C-2	1		
10	694441030	For UNIT sensor	CS1100C-3	1		
11	694441040	For OP spring	CS1100C-4	1		
12	694441050	Main board, motor	CS1100C-5	1		
13	694441060	Main board, power supply	CS1100C-6	1		
14	694441070	Switch, power supply	CS1100C-7	1		
15	640310450	Document support wire	IS31 Document support wire	3		

14.13 Disassembled Views of Changed Parts

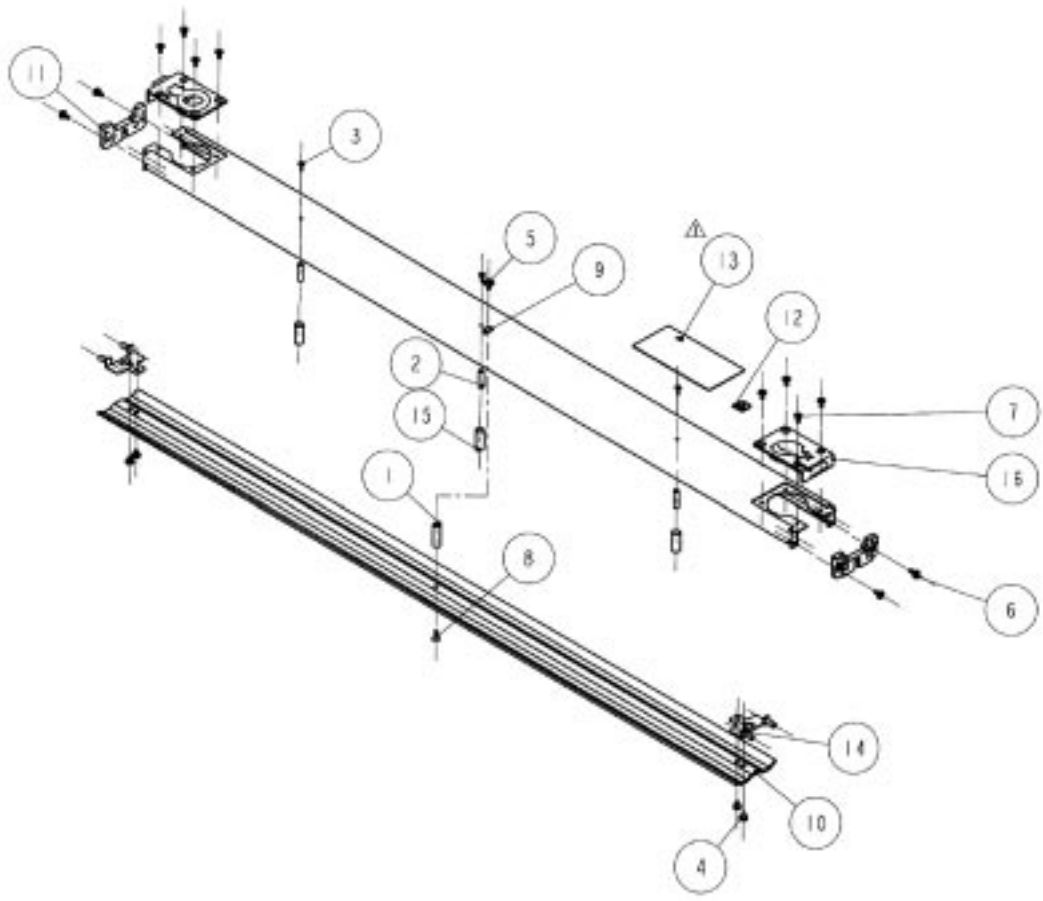
CS1100 foot assy.

No	Parts No.	Description	Q'ty	Remarks	
1	308014002	CP-30FF-1A	4		
2		M3 × 6 binding head screw	4		
3	641110370	C1 Foot cover	2		
4	641110380	C1 Foot stay	2		
5		F socket M6L15N1	4		



CS11 Hold-down unit EV maintenance (for CS1100)

No	Parts No.	Description	Q'ty	Remarks	
1		AR-320	1		
2		ARU-2015	3		
3		M2 × 6 binding head screw (black)	3		
4		M3 × 4 binding head screw (black)	4		
5		M3 × 6 TP screw (black)	1		
6		M3 × 6 binding head screw (black)	4		
7		M3 × 6 flat head screw	8		
8		M3 × 8 flat head screw	1		
9	641110230	C1-J hold-down base	1		
10	641110200	C1 hold-down CS	1		
11	641000210	Hold-down side	2		
12	641000820	Hold-down CS positioner	1		
13	641000710	Hold-down EV caution label	1		
14	641000441	Hold-down attachment	2		
15	380101741	Pressure spring C-174	3		
16	316422001	Ring latch C-42-2	2		



CS11 Hold-down unit EV maintenance (for CS1100)

No	Parts No.	Description	Q'ty	Remarks	
1		AR-320	1		
2		ARU-2015	5		
3		M2 × 6 binding head screw (black)	5		
4		M3 × 4 binding head screw	4		
5		M3 × 6 TP screw (black)	1		
6		M3 × 6 binding head screw (black)	4		
7		M3 × 6 flat head screw	8		
8		M3 × 8 flat head screw	1		
9	641000651	Hold-down base JEC	1		
10	641000660	Hold-down CS-JEC	1		
11	641000210	Hold-down side	2		
12	641000820	Hold-down CS positioner	1		
13		Hold-down EV caution label	1		
14	641000441	Hold-down attachment	2		
15	380101741	Pressure spring C-174	5		
16	316422001	Ring latch C-42-2	2